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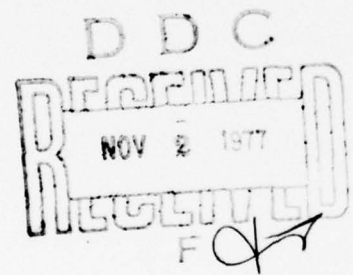
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COMPUTER CENTER LIBRARIES/NSRDC (SUBPROGRAMS)

by

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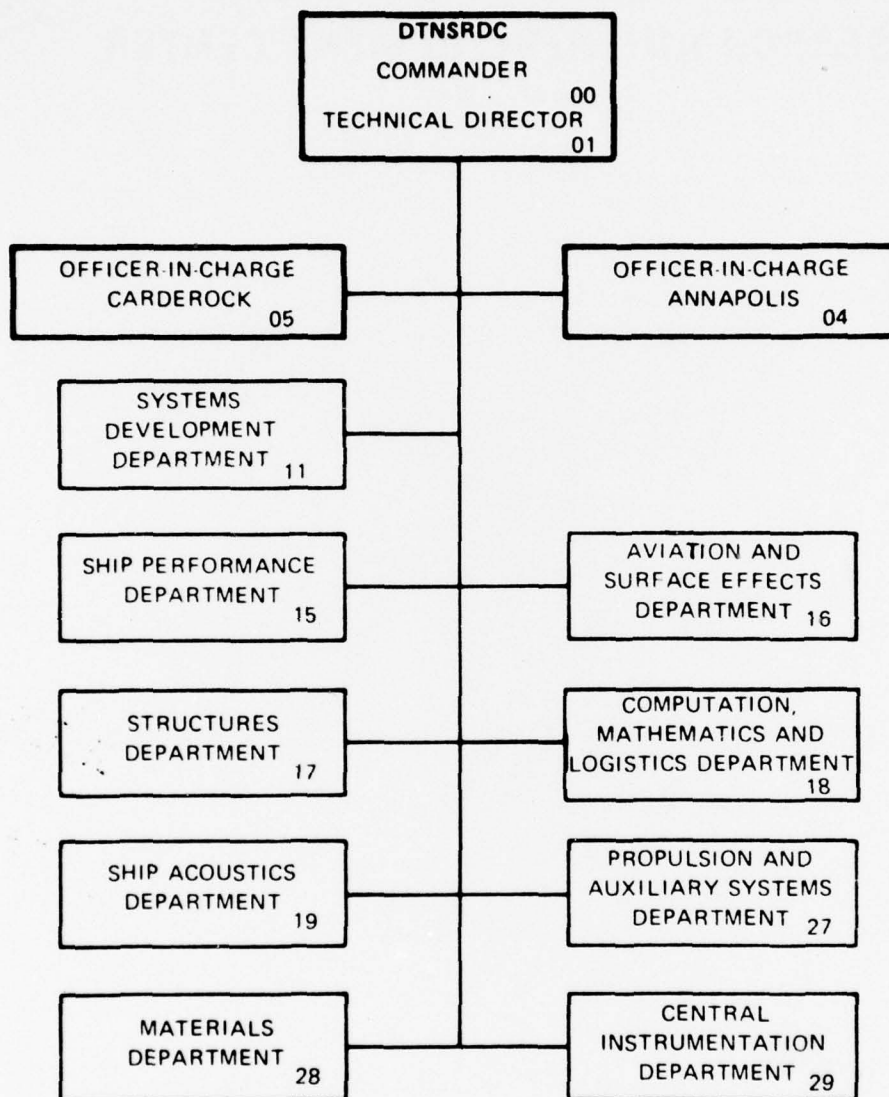


Computation, Mathematics and
Logistics Department

September 1977

CMLD-77-15

MAJOR DTNSRDC ORGANIZATIONAL COMPONENTS



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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Computer Center Libraries/NSRDC (Subprograms), CCLIB/N, is a reference manual which describes most of the subprograms in library 'NSRDC'. These scientific and utility routines are used primarily with Fortran (FTN, MNF or RATFOR) programs and most are coded in FTN. CCLIB/N lists the routines by functional category and alphabetically with a descriptive title. All currently available machine-readable documents detailing the use of these routines are included.		

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***** INTRODUCTION *****

THE COMPUTER CENTER MAKES AVAILABLE, IN ADDITION TO THE NOS/BE OPERATING SYSTEM, A WIDE VARIETY OF BOTH SCIENTIFIC AND UTILITY PROGRAMS, SUBPROGRAMS AND CATALOGUED PROCEDURES. MOST OF THE ROUTINES ARE MAINTAINED IN LIBRARIES ON PERMANENT FILES AND MAY BE INVOKED BY THE APPROPRIATE (LOADER) CONTROL CARDS. A FEW PROGRAMS ARE AVAILABLE AS INDEPENDENT PERMANENT FILES.

THE CCLIB-SERIES OF MANUALS CONTAINS THE FOLLOWING, WHICH DESCRIBE THE CONTENTS OF THE VARIOUS LIBRARIES MAINTAINED BY THE COMPUTER CENTER:

CCLIB	- COMPUTER CENTER LIBRARIES	CMLD-77-12
CCLIB/N	- COMPUTER CENTER LIBRARIES/NSRDC (SUBPROGRAMS)	CMLD-77-15
CCLIB/P	- COMPUTER CENTER LIBRARIES/PROFIL (PROCEDURES)	CMLD-77-16
CCLIB/U	- COMPUTER CENTER LIBRARIES/UTILITY (PROGRAMS)	CMLD-77-17
CCLIB/M	- COMPUTER CENTER LIBRARIES/MNSRDC (PROGRAMS)	

THIS MANUAL, CCLIB/N, IS A REFERENCE MANUAL WHICH DESCRIBES MOST OF THE SUBPROGRAMS IN LIBRARY 'NSRDC'.

*** HOW TO USE THIS MANUAL ***

THE ROUTINES ARE CLASSIFIED IN ONE OR MORE FUNCTIONAL CATEGORIES (SEE PAGE 1-2 FOR A LIST OF CATEGORIES). THEY ARE LISTED, BEGINNING ON PAGE 1-5, UNDER THE VARIOUS CATEGORIES. THE INDIVIDUAL ROUTINES ARE LISTED, WITH DESCRIPTIVE TITLE, BEGINNING ON PAGE 1-8. CHAPTER 2 CONTAINS ALL CURRENTLY AVAILABLE MACHINE-READABLE DOCUMENTS DESCRIBING THE USE OF SUBPROGRAMS IN LIBRARY 'NSRDC'. DOCUMENTATION NOT IN CHAPTER 2 MAY BE OBTAINED FROM USER SERVICES, CARDEROCK, BLDG 17, ROOM 100, (202) 227-1907.

*** LIBRARY NSRDC ***

'NSRDC' IS A LIBRARY OF DTNSRDC WRITTEN AND/OR SUPPORTED SUBPROGRAMS. SUBROUTINES FORMERLY AVAILABLE ONLY ON TAPE CLIBRARYUPD3 ARE INCLUDED. MANY SUBROUTINES HAVE NEVER BEEN PART OF ANY OTHER LIBRARY. THESE ROUTINES ARE USED PRIMARILY WITH FTN, MNF OR RATFOR PROGRAMS AND MOST ARE CODED IN FTN.

*** USING THE LIBRARY ***

THE FOLLOWING CONTROL CARDS MAY BE USED TO ACCESS 'NSRDC' DURING THE LOADING OF A PROGRAM:

```

...
FTN.  -OR-  COBOL.  -OR-  ATTACH,LGO,MYLGO,ID=XXXX.
ATTACH,NSRDC.
LDSET,LIB=NSRDC.  -OR-  LIBRARY,NSRDC.
LGO.
...

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*** FUNCTIONAL CATEGORIES ***

THE FOLLOWING FUNCTIONAL CATEGORIES ARE USED AT DTNSRDC. THOSE CATEGORIES PRECEDED BY AN ASTERISK (*) ARE LOCAL DTNSRDC CATEGORIES. THE OTHER ARE FROM THE VIM (COC USERS GROUP) LIST.

- A0 ARITHMETIC ROUTINES
- A1 REAL NUMBERS
- A2 COMPLEX NUMBERS
- A3 DECIMAL
- A4 I/O ROUTINES

- B0 ELEMENTARY FUNCTIONS
- B1 TRIGONOMETRIC
- B2 HYPERBOLIC
- B3 EXPONENTIAL AND LOGARITHMIC
- B4 ROOTS AND POWERS

- C0 POLYNOMIALS AND SPECIAL FUNCTIONS
- C1 EVALUATION OF POLYNOMIALS
- C2 ROOTS OF POLYNOMIALS
- C3 EVALUATION OF SPECIAL FUNCTIONS (NON-STATISTICAL)
- C4 SIMULTANEOUS NON-LINEAR ALGEBRAIC EQUATIONS
- C5 SIMULTANEOUS TRANSCENDENTAL EQUATIONS
- * C6 ROOTS OF FUNCTIONS

- D0 OPERATIONS ON FUNCTIONS AND SOLUTIONS OF DIFFERENTIAL EQUATIONS
- D1 NUMERICAL INTEGRATION
- D2 NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS
- D3 NUMERICAL SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS
- D4 NUMERICAL DIFFERENTIATION

- E0 INTERPOLATION AND APPROXIMATIONS
- E1 TABLE LOOK-UP AND INTERPOLATION
- E2 CURVE FITTING
- E3 SMOOTHING
- E4 MINIMIZING OR MAXIMIZING A FUNCTION

- F0 OPERATIONS ON MATRICES, VECTORS & SIMULTANEOUS LINEAR EQUATIONS
- F1 VECTOR AND MATRIX OPERATIONS
- F2 EIGENVALUES AND EIGENVECTORS
- F3 DETERMINANTS
- F4 SIMULTANEOUS LINEAR EQUATIONS

- G0 STATISTICAL ANALYSIS AND PROBABILITY
- G1 DATA REDUCTION (COMMON STATISTICAL PARAMETERS)
- G2 CORRELATION AND REGRESSION ANALYSIS
- G3 SEQUENTIAL ANALYSIS
- G4 ANALYSIS OF VARIANCE
- G5 TIME SERIES
- G6 SPECIAL FUNCTIONS (INCLUDES RANDOM NUMBERS AND PDF'S)
- * G7 MULTIVARIATE ANALYSIS AND SCALE STATISTICS
- * G8 NON-PARAMETRIC METHODS AND STATISTICAL TESTS
- * G9 STATISTICAL INFERENCE

H0 OPERATIONS RESEARCH TECHNIQUES, SIMULATION & MANAGEMENT SCIENCE
H1 LINEAR PROGRAMMING
H2 NON-LINEAR PROGRAMMING
H3 TRANSPORTATION AND NETWORK CODES
H4 SIMULATION MODELING
H5 SIMULATION MODELS
H6 CRITICAL PATH PROGRAMS
H8 AUXILIARY PROGRAMS
H9 COMBINED

I0 INPUT
I1 BINARY
I2 OCTAL
I3 DECIMAL
I4 BCD (HOLLERITH)
I9 COMPOSITE

J0 OUTPUT
J1 BINARY
J2 OCTAL
J3 DECIMAL
J4 BCD (HOLLERITH)
J5 PLOTTING
J7 ANALOG
J9 COMPOSITE

K0 INTERNAL INFORMATION TRANSFER
K1 EXTERNAL-TO-EXTERNAL
K2 INTERNAL-TO-INTERNAL (RELOCATION)
K3 DISK
K4 TAPE
K5 DIRECT DATA DEVICES

L0 EXECUTIVE ROUTINES
L1 ASSEMBLY
L2 COMPILING
L3 MONITORING
L4 PREPROCESSING
L5 DISASSEMBLY AND DERELATIVIZING
L6 RELATIVIZING
L7 COMPUTER LANGUAGE TRANSLATORS

M0 DATA HANDLING
M1 SORTING
M2 CONVERSION AND/OR SCALING
M3 MERGING
M4 CHARACTER MANIPULATION
M5 SEARCHING, SEEKING, LOCATING
M6 REPORT GENERATORS
M9 COMPOSITE

N0 DEBUGGING
N1 TRACING AND TRAPPING
N2 DUMPING
N3 MEMORY VERIFICATION AND SEARCHING
N4 BREAKPOINT PRINTING

00 SIMULATION OF COMPUTERS AND DATA PROCESSORS (INTERPRETERS)
01 OFF-LINE EQUIPMENT (LISTERS, REPRODUCERS, ETC.)
03 COMPUTERS
04 PSEUDO-COMPUTERS
05 SOFTWARE SIMULATION OF PERIPHERALS
09 COMPOSITE

P0 DIAGNOSTICS (HARDWARE MALFUNCTION)

Q0 SERVICE OR HOUSEKEEPING, PROGRAMMING AIDS
Q1 CLEAR/RESET
Q2 CHECKSUM ACCUMULATION AND CORRECTION
Q3 REWIND, TAPE MARK, LOAD CARDS, LOAD TAPE PROGRAMS, ETC.
Q4 INTERNAL HOUSEKEEPING, SAVE, RESTORE, ETC.
Q5 REPORT GENERATOR SUBROUTINES
Q6 PROGRAM DOCUMENTATION: FLOW CHARTS, DOCUMENT, STANDARDIZATION
Q7 PROGRAM LIBRARY UTILITIES

R0 LOGIC AND SYMBOLIC
R1 FORMAL LOGIC
R2 SYMBOL MANIPULATION
R3 LIST AND STRING PROCESSING

S INFORMATION RETRIEVAL

APPLICATIONS AND APPLICATION-ORIENTED PROGRAMS
T1 PHYSICS (INCLUDING NUCLEAR)
T2 CHEMISTRY
T3 OTHER PHYSICAL SCIENCES (GEOLOGY, ASTRONOMY, ETC.)
T4 ENGINEERING
T5 BUSINESS DATA PROCESSING
T6 MANUFACTURING (NON-DATA) PROCESSING AND PROCESS CONTROL
T7 MATHEMATICS AND APPLIED MATHEMATICS
T8 SOCIAL AND BEHAVIORAL SCIENCES AND PSYCHOLOGY
T9 BIOLOGICAL SCIENCES
T10 REGIONAL SCIENCES (GEOGRAPHY, URBAN PLANNING)
T11 COMPUTER ASSISTED INSTRUCTION

U0 LINGUISTICS AND LANGUAGES

V0 GENERAL PURPOSE UTILITY SUBROUTINES
V1 RANDOM NUMBER GENERATORS
V2 COMBINATORIAL GENERATORS: PERMUTATIONS, COMBINATIONS & SUBSETS
* V3 STANDARD AND SPECIAL PROBLEMS

X0 DATA REDUCTION
X1 RE-FORMATTING, DECOMMUTATION, ERROR DIAGNOSIS
X2 EDITING
X3 CALIBRATION
X4 EVALUATION
X5 ANALYSIS (TIME-SERIES ANALYSIS)
X6 SIMULATION (GENERATE TEST DATA FOR DATA REDUCTION SYSTEM)

Y0 INSTALLATION MODIFICATION
Y1 INSTALLATION MODIFICATION LIBRARY
Y2 NEWPL TAPE OF INSTALLATION MODIFICATIONS

Z0 ALL OTHERS

*** LIST OF SUBPROGRAMS BY CATEGORY ***

THE SUBPROGRAMS IN LIBRARY 'NSRDC' ARE LISTED BELOW UNDER THEIR FUNCTIONAL CATEGORIES. AN ALPHABETICAL LIST, WITH A BRIEF DESCRIPTION OF EACH ROUTINE BEGINS ON PAGE 1-8.

A0	ARITHMETIC ROUTINES					
	ICOMN	XOR				
A1	REAL NUMBERS					
	ISUMIT	NFILL	SUMIT			
A2	COMPLEX NUMBERS					
	CMPIV	HELP	PSI			
B1	TRIGONOMETRIC					
	COTAN					
B4	ROOTS AND POWERS					
	DPROOT	PROOT				
G1	EVALUATION OF POLYNOMIALS					
	APOWR	HIFAC	POWR1	PROD2		
	BPOWR	POLDIV	POWR2			
G2	ROOTS OF POLYNOMIALS					
	DPROOT	HELP	NROOTS	PROOT	QUART	
G3	EVALUATION OF SPECIAL FUNCTIONS (NON-STATISTICAL)					
	AT	BESSJ	GBSF	ELLIP	FRESNEL	PSI
	BEJY0	BESSK	CEI3	ERF	GAMCAR	SNCNDN
	BEJY1	BESSY	COMBES	ERROR	GAMMA	
	BESSI	BSJ	ELLI	EXPINT	LOGGAM	
G6	ROOTS OF FUNCTIONS					
	ROOTER					
D1	NUMERICAL INTEGRATION					
	FGI	FNOL3	QUADG	SIMP	SIMPUN	XFIL
D2	NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS					
	FNOL3	KUTMER				
E1	TABLE LOOK-UP AND INTERPOLATION					
	CRATAB	DISCOT	FRMRAN	FRMRA2		
E2	CURVE FITTING					
	FFT	GMHAS	OPLSA	RFFT	SPLFIT	
	FFT5	LSQSUB	POLYN	RFSN	SQFIT	
E3	SMOOTHING					
	SMOOTH					
E4	MINIMIZING OR MAXIMIZING A FUNCTION					
	MINMAX					

F1	VECTOR AND MATRIX OPERATIONS					
	MATINS					
F2	EIGENVALUES AND EIGENVECTORS					
	VARAH1	VARAH2				
F3	DETERMINANTS					
	GAUSS	MATINS				
F4	SIMULTANEOUS LINEAR EQUATIONS					
	BMAM	CMPIV	HAM	MATINS		
	CGAUSS	GAUSS	MAM200			
G1	DATA REDUCTION (COMMON STATISTICAL PARAMETERS)					
	STUTEE					
G4	ANALYSIS OF VARIANCE					
	ANOVA1	ANOVA2				
G6	SPECIAL FUNCTIONS (INCLUDES RANDOM NUMBERS AND PDF'S)					
	IAOC	IDAYWEK	RANUM			
I0	INPUT					
	FASTIN					
I2	OCTAL					
	OFMTDE	OFMTV				
I3	DECIMAL					
	CRDTAB					
I4	BCD (HOLLERITH)					
	ICOM	ICOMN	IFMTV			
I9	COMPOSITE					
	RECOVRD					
J2	OCTAL					
	PRTFL					
J4	BCD (HOLLERITH)					
	BANR	ICOM	ICOMN	LINE6	LINE8	PRTIME
J5	PLOTING					
	PLOTMY	PLOTPR	PLOTXY			
K2	INTERNAL-TO-INTERNAL (RELOCATION)					
	GETRA	MFETCH	MSET	RCPA		

M0	DATA HANDLING					
	COMPSTR	EQU60	MASKIT			
M1	SORTING					
	ASORT	QSORT	SSORT	SSORTI		
	ASORTMV	QSORT1	SSORTF	SSORTL		
M2	CONVERSION AND/OR SCALING					
	GETHOUR	IROMAN	JGDATE	MONTH	WEKDAY	
	IHMS	ISEC	JULIAN	NEWBAT		
M4	CHARACTER MANIPULATION					
	ADJL	EXPRM	IBUNP	PUTCHA	SBYT	TRAILBZ
	ADJR	EXTBIT	IPAKLFT	PUTCHR	SEMICO	VALDAT
	ASHIFT	EXTPRM	ISTAPE	REPLAC	SENT	VFILL
	CENTER	FBINRD	LBYT	REPLACH	SETREW	ZBLANK
	CHFILL	GETCHA	LEFTADJ	REPLHI	SHIFTA	ZEROES
	CONTRCT	GETCHR	MOVSTR	REPLLO	SKWEZL	ZEROFL
	EXPAND	GETPRM	PARGET	REPLNE	SKWEZR	ZEROS
M5	SEARCHING, SEEKING, LOCATING					
	AMAXE	FINDW	GETCHR	LASTC	MINE	VALIDT
	AMINE	FINDWRD	IDIGIT	LASTWRD	NFILLT	
	FINDC	GETCHA	IFINDCH	MAXE	NUMVAR	
N0	DEBUGGING					
	ALTIME	ELTIME	PRTIME			
N2	DUMPING					
	DMPA	DMPFIT	DUMPCPA	DUMPFL		
	DMPCPA	DUMPA	DUMPFIT	RECOVRD		
Q0	SERVICE OR HOUSEKEEPING, PROGRAMMING AIDS					
	AC	FTNRFL	HERE	JOBORG	PERC	ZPFPUT
	ALTIME	GETFIT	IDIO	MACHINE	PRTFL	ZRTPJT
	CPU467	GETLNS	ISITCNF	NUMEXEC	REDUCE	
	ELTIME	GODROP	JOBNAME	QVLNAME	SKPSTAT	
Q3	FILE MANIPULATION					
	REQUEST	ROUTE	SKPFIL	UNLOAD	ZPFUNC	ZSYSEQ
Q4	INTERNAL HOUSEKEEPING, SAVE, RESTORE, ETC.					
	NUMVAR	PRTIME				
R1	FORMAL LOGIC					
	COUPLE	XOR				
T4	ENGINEERING					
	ARDCFT					
V1	RANDOM NUMBER GENERATORS					
	RANNUM					

*** DESCRIPTIVE TITLES ***

SUBPROGRAMS IN LIBRARY 'NSRDC' ARE LISTED ALPHABETICALLY BELOW.

AC	GET ACCOUNT NUMBER FOR THIS JOB
ADJL	LEFT ADJUST A LINE OF WORDS LEAVING ONE SPACE BETWEEN WORDS
ADJR	RIGHT ADJUST A LINE OF WORDS LEAVING ONE SPACE BETWEEN WORDS
AI	AIRY FUNCTION INTEGRAL
ALTIME	OBTAIN CPA, CPB, CP, PP, IO AND WALL CLOCK TIMES SINCE START OF JOB (OR INTERCOM SESSION)
AMAXE	FIND MAXIMUM VALUE OF AN ARRAY (ALSO CONTAINS MAXE)
AMINE	FIND MINIMUM VALUE OF AN ARRAY (ALSO CONTAINS MINE)
ANOVA1	ONE-WAY ANALYSIS OF VARIANCE WITH UNEQUAL N
ANOVA2	TWO-WAY ANALYSIS OF VARIANCE WITH EQUAL N
APOWR	EXPONENTIATION OF POWER SERIES - ONE VARIABLE
ARDCFT	PROPERTIES OF U.S. STANDARD ATMOSPHERE (1962)
ASHIFT	SHIFT EACH WORD OF AN ARRAY
ASORT	FTN ALPHANUMERIC SORT
ASORTMV	SORT 2-DIMENSIONAL ARRAY USING MOVLEV
BANP	PRINT A BANNER (PAGE)
BEJY0	ZERO-ORDER BESSEL FUNCTIONS FOR REAL ARGUMENTS
BEJY1	FIRST ORDER BESSEL FUNCTIONS FOR REAL ARGUMENTS
BESSI	MODIFIED BESSEL FUNCTION OF THE FIRST KIND
BESSJ	BESSEL FUNCTION OF THE FIRST KIND
BESSK	MODIFIED BESSEL FUNCTION OF THE SECOND KIND
BESSY	BESSEL FUNCTION OF THE SECOND KIND
BMAN	SOLVE SYSTEM $AX=B$ FOR BANDED SYMMETRIC MATRICES
BPOWR	EXPONENTIATION OF POWER SERIES IN TWO VARIABLES

BSJ	SPHERICAL BESSEL FUNCTION
CBSF	COMPLEX BESSEL FUNCTION FOR LARGE ARGUMENT
CEI3	COMPLETE ELLIPTIC INTEGRAL OF THE THIRD KIND
CENTER	CENTER A CHARACTER STRING WITHIN AN OUTPUT FIELD
CGAUSS	COMPLEX SOLUTION OF SIMULTANEOUS EQUATIONS AND DETERMINANT BY ITERATIVE GAUSSIAN ELIMINATION
CHFILL	FILL (PORTION OF) AN ARRAY WITH A CHARACTER
CMPIV	COMPLEX MATRIX INVERSION
COMBES	BESSEL FUNCTIONS FOR COMPLEX ARGUMENT AND ORDER
COMPSTR	COMPARE TWO CHARACTER STRINGS
CONTRCT	SQUEEZE ARRAY OF 1R-FORMAT CHARACTERS TO LEFT (SEE EXPAND)
COTAN	COTANGENT FUNCTION
COUPLE	LOGICALLY CONNECT TWO WORDS
CRDTAB	READ TABLES FOR FRMRAN AND FRMRA2 INTERPOLATION
DISCOT	SINGLE OR DOUBLE INTERPOLATION
DMPA	CALLABLE OCTAL AND CHARACTER DUMP OF SPECIFIED PORTION OF USER'S FIELD LENGTH (FL) (BY ACTUAL LOCATION) (NO HEADINGS ARE PROVIDED)
DMPCPA	DUMP JOB CONTROL POINT AREA
DMPFIT	SHORT DUMP OF FTN OR RM FILE INFORMATION TABLE (FIT)
DPROOT	FIND ALL ROOTS OF A REAL DOUBLE PRECISION POLYNOMIAL
DUMPA	GIVE OCTAL AND CHARACTER DUMP OF USER-SPECIFIED AREA
DUMPCPA	EXPANDED DUMP OF JOB CONTROL POINT AREA
DMPFIT	DETAILED DUMP OF FTN OR RM FILE INFORMATION TABLE (FIT)
DUMFPL	CALLABLE OCTAL AND CHARACTER DUMP OF SPECIFIED PORTION OF USER'S FIELD LENGTH (FL) (BY ACTUAL LOCATION)
ELLI	ELLIPTIC INTEGRAL
ELLIP	ELLIPTIC INTEGRAL

ELTIME	OBTAIN CPA, CPB, CP, PP, IO AND WALL CLOCK TIMES SINCE LAST CALL TO ELTIME
EQU60	LOGICAL COMPARE (OF 2 ARRAYS)
ERF	ERROR FUNCTION
ERROR	ERROR FUNCTION
EXPAND	EXPAND CHARACTER STRING INTO ARRAY OF 1R-FORMAT WORDS (SEE CONTRCT)
EXPINT	EXPONENTIAL INTEGRAL
EXPRM	EXTRACT NEXT PARAMETER FROM EXECUTE CARD
EXTBIT	EXTRACT BITS FROM A WORD
EXTPRM	EXTRACT NEXT PARAMETER FROM USER-SUPPLIED PARAMETER STRING
FASTIN	READ AND UNPACK DATA PREPARED ON THE XDS-910 A/D CONVERSION SYSTEM
FBINRD	UNPACK AN INPUT ARRAY (N BITS PER INPUT CHARACTER INTO CDC WORD)
FFT	FAST FOURIER TRANSFORM FOR COMPLEX TABULATED FUNCTION
FFT5	FAST FOURIER TRANSFORM
FGI	FORTRAN GAUSSIAN INTEGRATION
FINDC	FIND PRESENCE OR ABSENCE OF SPECIFIED CHARACTER IN AN ARRAY (USER SPECIFIES RELATIONAL OPERAND)
FINDW	FIND PRESENCE OR ABSENCE OF SPECIFIED WORD IN AN ARRAY (USER SPECIFIES RELATIONAL OPERAND)
FINDWRD	FIND SPECIFIED WORD IN AN ARRAY
FNOL3	INTEGRATE SYSTEM OF ORDINARY DIFFERENTIAL EQUATIONS
FRESNEL	EVALUATE FRESNEL INTEGRALS
FRMRAN	LINEAR TABLE INTERPOLATION (ONE OR TWO INDEPENDENT VARIABLES)
FRMRA2	LINEAR TABLE INTERPOLATION (MULTIPLE INDEPENDENT VARIABLES)
FTNRFL	GET/SET CORE SIZE
GAMCAR	COMPLEX GAMMA FUNCTION OF A COMPLEX ARGUMENT HAVING POSITIVE REAL PART
GAMMA	INCOMPLETE OR COMPLETE GAMMA FUNCTION

GAUSS	SIMULTANEOUS EQUATION SOLUTION WITH DETERMINANT BY ITERATIVE GAUSSIAN ELIMINATION
GETCHA	EXTRACT CHARACTER FROM SPECIFIED POSITION IN AN ARRAY
GETCHR	EXTRACT CHARACTER FROM SPECIFIED POSITION IN A WORD
GETFIT	GET SPECIFIED FIT ADDRESS
GETLFNS	GET ACTUAL LOCAL FILE NAMES (FOR FTN)
GETPRM	GET ALL PARAMETERS ON EXECUTE CARD
GETRA	GET PROGRAM COMMUNICATION REGION (RA+0 THRU RA+778)
GMHAS	HARMONIC ANALYSIS
GODROP	ISSUE USER-SPECIFIED GO/DROP MESSAGE
HELP	COMPLEX ZEROES OF REAL OR COMPLEX POLYNOMIAL
HERE	GET TERMINAL ID FOR THIS JOB
HIFAC	HIGHEST COMMON FACTOR OF TWO POLYNOMIALS
IAOC	COUNT ONE-BITS IN SPECIFIED WORD
IBUNP	UNPACK 12-BIT BYTES FROM ARRAY
ICOM	INTERACTIVE COMMUNICATOR (SYMBOLIC) -- READ RESPONSE AND COMPARE WITH LIST OF VALID RESPONSES
ICOMN	INTERACTIVE COMMUNICATOR (INTEGER NUMERIC) -- READ NUMBER AND TEST TO SEE IF IN SPECIFIED RANGE
IDAYWEK	FUNCTION TO DETERMINE THE DAY OF THE WEEK FOR ANY DATE FROM 10/15/1582 THRU 02/28/4000
IDIO	GET USER INITIALS (AND INTERCOM USER ID) FROM CHARGE CARD OR LOGIN
IDIGIT	CHECK FOR DIGITS IN A FIELD WITHIN A WORD
IFINOC	FIND FIRST OCCURRENCE OF SPECIFIED CHARACTER IN ARRAY
IFMTV	FAST I-FORMAT DECODE OF VARIABLE LENGTH INPUT
IHMS	CONVERT SECONDS TO 'HH.MM.SS.' (SEE ISEC)
IPAKLFT	SQUEEZE LEFT AND REMOVE ZEROS (003) AND BLANKS (558), RETURN NUMBER OF CHARACTERS
IRMAN	CONVERT ROMAN NUMBERS TO INTEGER

ISEC	CONVERT HH.MM.SS TO SECONDS (SEE IHMS)
ISITCNF	TEST FOR CONNECTED FILE
ISTAPE	GENERATE TAPE NAME 'TAPENN'
ISUMIT	SUM ELEMENTS OF INTEGER ARRAY
JGDATE	CONVERT ANY GREGORIAN DATE TO A JULIAN DATE AND VICE VERSA (MULTI-YEAR)
JOBNAME	GET NOS/BE JOB NAME FOR THIS JOB
JOBORG	GET JOB ORIGIN (BATCH, INTERCOM, GRAPHICS, MULTI-USER)
JULIAN	CONVERT ANY GREGORIAN DATE TO A JULIAN DATE AND VICE VERSA (SINGLE YEAR)
KUTMER	INTEGRATE A SYSTEM OF FIRST-ORDER ORDINARY DIFFERENTIAL EQUATIONS USING THE KUTTA-MERSON FOURTH-ORDER, SINGLE-STEP METHOD
LASTC	FIND LAST NON-BLANK CHARACTER IN ARRAY
LASTWRD	FIND LAST WORD OF A PRAY WHICH CONTAINS A NON-BLANK CONTAINS A NON-BLANK
LBYT	EXTRACT VARIABLE LENGTH BYTE
LEFTADJ	SQUEEZE LEFT AND REMOVE BLANKS AND 003 (USER MAY SUPPLY TRAILING FILL CHARACTER)
LINE6	SET PRINT FILE TO 6 LINES PER INCH
LINE8	SET PRINT FILE TO 8 LINES PER INCH
LOGGAM	LOGARITHM OF GAMMA FUNCTION FOR COMPLEX ARGUMENT
LSQSUB	GENERAL WEIGHTED LEAST SQUARES FIT
MAM	SOLVE SYMMETRIC SYSTEM OF LINEAR EQUATIONS
MAM200	SOLVE 200 SYMMETRIC LINEAR EQUATIONS
MASKIT	DYNAMIC MASK GENERATOR
MATINS	MATRIX INVERSE WITH SIMULTANEOUS EQUATION SOLUTION AND DETERMINANT
MAXE	FIND MAXIMUM VALUE OF AN ARRAY (ALSO CONTAINS AMAXE)
MFETCH	FETCH A SINGLE WORD FROM USER'S FL (SEE MSET)
MFX	OBTAIN THE MAINFRAME ON WHICH THE PROGRAM IS RUNNING
MINE	FIND MINIMUM VALUE OF AN ARRAY (ALSO CONTAINS AMINE)

MINMAX	GENERALIZED NONLINEAR ITERATOR
MONTH	FROM A DATE (MM/DD/YY) FIND THE MONTH AND RETURN FULL SPELLING AND 3- OR 4-CHARACTER ABBREVIATION
MOVSTR	MOVE A STRING OF CHARACTERS FROM ONE ARRAY TO ANOTHER
MSET	SET A SINGLE WORD IN USER'S FL (SEE MFETCH)
NEWDAT	ADD/SUBTRACT SPECIFIED NUMBER OF DAYS TO/FROM A GIVEN DATE
NFILL	FILL ELEMENTS 1 THRU N OF AN ARRAY WITH THE VALUES 1 THRU N, RESPECTIVELY
NFILLT	TEST AN ARRAY FOR THE PRESENCE OF THE INTEGERS 1 THRU N IN ELEMENTS 1 THRU N, RESPECTIVELY
NROOTS	REAL AND COMPLEX ROOTS OF REAL POLYNOMIAL
NUMEXEC	GET NUMBER OF EXECUTE CARD PARAMETERS WHICH WERE USED IN THIS EXECUTION OF THE PROGRAM
NUMVAR	DETERMINE NUMBER OF ARGUMENTS IN CALL TO SUBPROGRAM
OFMTDE	FAST O-FORMAT DECODE
OFMTV	FAST O-FORMAT DECODE OF VARIABLE LENGTH INPUT
OPLSA	ORTHOGONAL POLYNOMIAL LEAST SQUARE APPROXIMATION
OVLNAME	GET NAME OF FILE CURRENTLY BEING EXECUTED
PARGET	GET ALL PARAMETERS OF USER-SUPPLIED PARAMETER STRING
PFRG	SUPPLY DESCRIPTION OF PERMANENT FILE FUNCTION RETURN CODE
PLOTMY	PRINTER PLOT - MULTIPLE CURVES
PLOTPR	PRINTER PLOT - MULTIPLE CURVES
PLOTXY	PRINTER PLOT - SINGLE CURVE
POLDIV	POLYNOMIAL DIVISION
POLYN	LEAST SQUARES POLYNOMIAL FIT
POWP1	1 TERM IN EXPONENTIATION OF POWER SERIES - ONE VARIABLE
POWP2	1 TERM IN EXPONENTIATION OF POWER SERIES - TWO VARIABLES
PROD2	1 TERM IN PRODUCT OF POWER SERIES - TWO VARIABLES

PROOT	FIND ALL ROOTS OF A REAL PLOYNOMIAL
PRTEL	PRINT CURPENT FL (OR PUT INTO DAYFILE)
PRTIME	GET AND PRINT CPA, CPB, CP, PP, IO AND WALL CLOCK TIMES SINCE LAST CALL AND PRINT USER-SUPPLIED MESSAGE
PSI	COMPLEX PSI FUNCTION
PUTCHA	INSERT CHARACTER INTO SPECIFIED POSITION IN AN ARRAY
PUTCHR	INSERT CHARACTER INTO SPECIFIED POSITION IN A WORD
QSORT	IN-CORE ASCENDING SORT FOR ARRAYS LARGER THAN 500 WORDS
QSORT1	IN-CORE ASCENDING SORT WITH RE-ORDERING OF ASSOCIATED ARRAY (FOR ARRAYS LARGER THAN 500 WORDS)
QUADG	INTEGRAL BY GAUSS-LEGENDRE 10-POINT QUADRATURE
QUART	REAL OR COMPLEX ROOTS OF QUARTIC
RANNUM	NORMALLY DISTRIBUTED RANDOM NUMBERS
RCPA	READ (A PORTION OF) CONTROL POINT AREA
RECOVRD	ON RECOVERY, PRINT EXCHANGE JUMP PACKAGE, RA+0 THRU RA+77B
REDUCE	REDUCE FL TO MINIMUM -OR- REQUEST ADDITIONAL FL RELATIVE TO START OF BLANK COMMON
REPLAC	REPLACE ONE CHARACTER WITH ANOTHER IN AN ARRAY
REPLACM	REPLACE SEVERAL CHARACTERS WITH OTHER CHARACTERS
REPLHI	REPLACE ALL CHARACTERS GREATER THAN SPECIFIED CHARACTER WITH NEW CHARACTER
REPLLO	REPLACE ALL CHARACTERS LESS THAN SPECIFIED CHARACTER WITH NEW CHARACTER
REPLNE	REPLACE ALL CHARACTERS (EXCEPT SPECIFIED CHARACTER) WITH A SPECIFIED CHARACTER
REQUEST	CALLABLE REQUEST COMMAND
RFFT	FAST FOURIER TRANSFORM FOR REAL TABULATED DATA
RFSN	REVERSE FAST FOURIER TRANSFORM
ROOTER	GENERAL ROOT FINDER
ROUTE	CALLABLE ROUTE COMMAND
SBYT	STORE VARIABLE LENGTH BYTE

SEMICO	REPLACE DISPLAY CODE 008 WITH 778 (SEMI-COLON)
SENT	MOVE WORDS FROM ONE ARRAY TO ANOTHER, FORWARD OR BACKWARD
SETREW	CONVERT ALPHABETIC REWIND OPTION INTO RM OPEN AND CLOSE CODES
SHIFTA	SHIFT ARRAY A SPECIFIED NUMBER OF BITS (CROSSING OVER WORD BOUNDARIES)
SIMP	SIMPSON'S RULE INTEGRATION
SIMPUN	SIMPSON'S RULE INTEGRATION - UNEQUAL INTERVALS
SKWEZL	SQUEEZE LEFT AND REMOVE BLANKS AND 008
SKWEZR	SQUEEZE RIGHT AND REMOVE BLANKS AND 008
SMOOTH	LEAST SQUARES POLYNOMIAL SMOOTHING
SNCNDN	JACOBIAN ELLIPTIC FUNCTION
SPLFIT	SPLINE CURVE FIT
SQFIT	POLYNOMIAL LEAST SQUARE FIT
SSORT	FTN SHELL SORT
SSORTF	FTN CALLABLE SHELL SORT FOR TWO-DIMENSIONAL ARRAYS
SSORTI	FTN CALLABLE SHELL SORT FOR TWO-DIMENSIONAL ARRAYS
SSORTL	FTN LOGICAL SHELL SORT
STUTEE	STUDENT'S T DISTRIBUTION
SUMIT	SUM ELEMENTS OF REAL ARRAY
TRAIL9Z	CHANGE TRAILING BLANKS TO ZEROS (008)
UNLOAD	UNLOAD A FORTRAN FILE
VALDAT	LOGICAL FUNCTION TO VALIDATE A DATE FORMAT
VALIDT	VALIDATE AN ARRAY TO SEE THAT EACH ELEMENT IS ONE OF A USER-SPECIFIED LIST
VARAH1	EIGENVALUES AND EIGENVECTORS OF A GENERAL REAL MATRIX
VARAH2	IMPROVED ESTIMATES AND BOUNDS FOR EIGENSYSTEM OF A GENERAL REAL MATRIX
VFILL	FILL AN ARRAY WITH USER-SPECIFIED WORD
WEKDAY	DETERMINE THE DAY OF THE WEEK FOR ANY GREGORIAN DATE FROM OCTOBER 15, 1582 THRU FEBRUARY 28, 4000

XFIL	FILON'S METHOD FOR INTEGRALS WITH SIN AND COS
XOR	EXCLUSIVE-OR FUNCTION
ZBLANK	CHANGE BLANKS TO 00B AND VICE VERSA
ZEROES	REPLACE BLANKS WITH (DISPLAY CODE) ZEROS, MULTIPLE FIELDS
ZEROFL	ZERO FIELD LENGTH (SECURITY EOJ)
ZEROS	REPLACE BLANKS WITH (DISPLAY CODE) ZEROS, MULTIPLE FIELDS
ZPFPUT	PUT USER-SPECIFIED PARAMETERS INTO ARRAY FOR LATER CALL TO ZPFUNC
ZPFUNC	CALLABLE PERMANENT FILE FUNCTIONS
ZRTPUT	PUT USER-SPECIFIED PARAMETERS INTO ARRAY FOR LATER CALL TO ROUTE
ZSYSEQ	FORTRAN CALLABLE SYSTEM CALL

***** SUBPROGRAM DOCUMENTATION *****

THIS CHAPTER CONTAINS THE MACHINE-READABLE DOCUMENTATION FOR MANY SUBPROGRAMS IN LIBRARY 'NSRDC'. NON-MACHINE-READABLE DOCUMENTATION FOR OTHER ROUTINES IN THE LIBRARY IS ON FILE IN USER SERVICES, CODE 1892.1, (202) 227-1907.

INDIVIDUAL DOCUMENTS MAY BE PRINTED USING:

BEGIN,UTILITY,,PROGDOC,NSRDC,,<SUBPROG>,OUTPUT.

WHERE <SUBPROG> IS THE DESIRED DOCUMENT.

SEVERAL DOCUMENTS MAY BE PRINTED AT ONE TIME USING:

JOBNAME.
CHARGE,....
BEGIN,UTILITY,,MANYDOC,NSRDC.
" 7/8/9 EOR
<SUBPROG1>
<SUBPROG2>
...
<SUBPROGN>
" 6/7/8/9 EOF

SUBROUTINE 'AC'
FUNCTION 'AC'

PURPOSE

GET ACCOUNT NUMBER FOR THIS JOB

FUNCTIONAL CATEGORY: Q0

USAGE

CALL AC (I)
IVARIABLE = AC (I)

DESCRIPTION OF PARAMETERS

AC - WILL CONTAIN ACCOUNT NUMBER
(INTEGER TYPE VARIABLE)
I - WILL ALSO CONTAIN ACCOUNT NUMBER

REMARKS

'AC' MUST BE DECLARED INTEGER IN THE CALLING ROUTINE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

RCPA - READ CONTROL POINT AREA

ARITHMETIC STATEMENT FUNCTIONS

L71FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

METHOD

THE ACCOUNT NUMBER IS TAKEN FROM CONTROL POINT AREA.

CM REQUIRED: 378

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

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DATE(S) REVISED

02/27/76

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ADJL'

PURPOSE

LEFT ADJUST A LINE OF WORDS LEAVING ONE SPACE BETWEEN WORDS

FUNCTIONAL CATEGORY: M4

USAGE

CALL ADJL (A, NA, NC, NW, NWORDS)

DESCRIPTION OF PARAMETERS

A - ARRAY CONTAINING WORDS TO BE LEFT-ADJUSTED
(WILL BE REPLACED BY LEFT-ADJUSTED ARRAY)
NA - NUMBER OF COMPUTER WORDS IN 'A' (DIMENSION OF 'A')
NC - OUTPUT NUMBER OF CHARACTERS
NW - OUTPUT NUMBER OF COMPUTER WORDS
(SUBSCRIPT OF LAST NON-BLANK WORD IN 'A')
NWORDS - OUTPUT NUMBER OF WORDS IN LINE

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

GETCHA - GET CHARACTER FROM ARRAY

PUTCHA - PUT CHARACTER INTO ARRAY

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 1473

AUTHOR

DAVID V SOMMER - DTNSROC CODE 1892.2

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DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ADJR'

PURPOSE

RIGHT ADJUST A LINE OF WORDS LEAVING ONE SPACE BETWEEN WORDS

FUNCTIONAL CATEGORY: M4

USAGE

CALL ADJR (A, NA, NC, NW, NWORDS)

DESCRIPTION OF PARAMETERS

A - ARRAY CONTAINING WORDS TO BE RIGHT-ADJUSTED
(WILL BE REPLACED BY RIGHT-ADJUSTED ARRAY)
NA - NUMBER OF COMPUTER WORDS IN 'A' (DIMENSION OF 'A')
NC - OUTPUT POSITION OF FIRST NON-BLANK CHARACTER
NW - OUTPUT SUBSCRIPT OF FIRST NON-BLANK WORD IN 'A'
NWORDS - OUTPUT NUMBER OF WORDS IN LINE

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

GETCHA - GET CHARACTER FROM ARRAY
PUTCHA - PUT CHARACTER INTO ARRAY

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 157B

AUTHOR

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LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ALTIME'

PURPOSE

OBTAIN CPA, CPB, CP, PP, IO AND WALL CLOCK TIMES SINCE
START OF JOB (OR INTERCOM SESSION)

FUNCTIONAL CATEGORY: Q0 NO

USAGE

CALL ALTIME (TIMES)

DESCRIPTION OF PARAMETER

TIMES - 7-WORD ARRAY TO CONTAIN THE FOLLOWING:

- 1 - CPA TIME IN SECONDS
- 2 - CPB TIME IN SECONDS
- 3 - CP TIME IN SECONDS (CPA+CPB)
- 4 - PP TIME IN SECONDS
- 5 - IO TIME IN SECONDS
- 6 - WALL CLOCK TIME (HH.MM.SS.)
- 7 - WALL CLOCK TIME IN SECONDS

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

- ISEC - CONVERT HH.MM.SS TO SECONDS
RCPA - READ CONTROL POINT AREA

ARITHMETIC STATEMENT FUNCTIONS

R65FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

CM REQUIRED: 60B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

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LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ASHIFT'

PURPOSE

SHIFT EACH WORD OF AN ARRAY

FUNCTIONAL CATEGORY: M4

USAGE

CALL ASHIFT (A, NA, NABITS)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SHIFTED

NA - NUMBER OF WORDS IN 'A' TO BE SHIFTED

NBITS - NUMBER OF BITS TO SHIFT

REMARKS

ALL ARGUMENTS ARE TYPE 'INTEGER'

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 178

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 1973

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ASORT'

PURPOSE

FTN ALPHANUMERIC SORT

FUNCTIONAL CATEGORY: M1

USAGE

```
CALL ASORT (A, I, L, TEM, PT, COL, KEY, TRANA, KEYM)
CALL ASORT (A, I, L, TEM, PT, COL, KEY, 0, KEYM)
CALL ASORT (A, I, L, TEM, PT, COL, KEY, TRANA)
CALL ASORT (A, I, L, TEM, PT, COL, KEY)
CALL ASORT (A, I, L, TEM, PT, COL)
```

DESCRIPTION OF PARAMETERS

A - TWO-DIMENSIONAL ARRAY TO BE SORTED
I - NUMBER OF COLUMNS (LINES) TO BE SORTED
L - NUMBER OF ROWS (LENGTH OF LINE) PER COLUMN
TEM - TEMPORARY WORK ARRAY OF DIMENSION 'I'
PT - TEMPORARY WORK ARRAY OF DIMENSION 'I'
COL - TEMPORARY WORK ARRAY OF LENGTH 'L'
KEY - IF PRESENT, IS ARRAY OF LENGTH 'L' LISTING THE SORT KEYS:
KEY(1)=5 IMPLIES THAT THE PRIMARY SORT KEY IS ROW 5
KEY(2)=7 " " " SECONDARY " " " ROW 7
...
KEY(N)=M " " " N-TH " " " ROW M
KEY(N)=0 IMPLIES THAT THE SORT ENDS AFTER N-1 SORT KEYS ARE USED
TRANA - IF PRESENT, I 63-WORD ARRAY DEFINING THE COLLATING SEQUENCE.
IF ABSENT OR 0, DISPLAY CODE VALUES ARE USED.
IF 0, KEYM CAN BE USED WITHOUT CHANGING THE COLLATING SEQUENCE.
KEYM - IF PRESENT, IS AN ARRAY OF LENGTH 'L' FURTHER DEFINING THE SORT KEYS. (E.G., KEYM(2) IS A MASK DEFINING WHAT BITS OF THE SECONDARY SORT KEY WILL BE USED.)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE
IA3S LOCF SHIFT
OTHERS
EQU60
SENT
SSORTL

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 4748

AUTHOR
C FLINK - KPS - NWL

DATE WRITTEN: 03/08/71

DATE(S) REVISED
06/23/72 - C FLINK

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ASORTMV'

PURPOSE

 SORT 2-DIMENSIONAL ARRAY USING MOVLEV

FUNCTIONAL CATEGORY: M1

USAGE

 CALL ASORTMV (A, NROW, NCOL, IROW, UPDOWN, TEMP, SWAP)

DESCRIPTION OF PARAMETERS

 A - 2-DIMENSIONAL ARRAY TO BE SORTED
 NROW - NUMBER OF ROWS IN ARRAY 'A' (FIRST DIMENSION)
 NCOL - NUMBER OF COLUMNS IN ARRAY 'A' (SECOND DIMENSION)
 IROW - ROW POSITION TO BE SORTED
 UPDOWN - SORT ORDER DESIRED
 1LA - ASCENDING SORT
 1LD - DESCENDING SORT
 TEMP - WORK ARRAY OF DIMENSION 'NROW' OR GREATER
 SWAP - RETURN CODE
 0 - NO SWAPPING WAS NECESSARY
 (ARRAY ALREADY IN ORDER)
 1 - AT LEAST 1 SWAP WAS NECESSARY
 2 - UPDOWN INVALID, ASCENDING SORT ASSUMED,
 NO SWAPPING WAS NECESSARY
 3 - UPDOWN INVALID, ASCENDING SORT ASSUMED,
 AT LEAST 1 SWAP WAS NECESSARY
 4 - IROW <= 0
 5 - IROW > NROW

REMARKS

 IN ORDER TO USE 'MOVLEV', ALL RELATED DATA TO BE SWAPPED
 MUST BE PHYSICALLY LOCATED NEXT TO EACH OTHER, THAT IS, EACH
 ROW OF 'A' CONTAINS RELATED DATA.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

 PART OF LANGUAGE

 MOVLEV

 OTHERS

 NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 165B

AUTHOR

 DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 02/01/75

DATE(S) REVISED

LOCATION OF DECKS

 SOURCE

 UPDATE LIBRARY: NSRDCPL,ID=CSYS

 OBJECT

 EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'BANR'

PURPOSE

PRINT A BANNER (PAGE)

FUNCTIONAL CATEGORY: J4

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 02/18/75

DATE(S) REVISED

USAGE

CALL BANR (DUMMY, IOUT, NEWPAGE)

DESCRIPTION OF PARAMETERS

DUMMY - 1-10 CHARACTERS TO BE PRINTED

(LEFT-JUSTIFIED, BLANK- OR ZERO-FILLED)

IOUT - NUMBER OF FILE ON WHICH BANNER IS TO BE WRITTEN

NEWPAGE - IF ARGUMENT IS NON-ZERO, BANNER IS WRITTEN ON
SAME PAGE

IF ARGUMENT IS ZERO OR MISSING, BANNER IS WRITTEN
ON A NEW PAGE

REMARKS

ONLY 3 BANNERS WILL FIT ON A PAGE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

MOVLEV

SHIFT

OTHERS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 15408

LOCATION OF DECKS

SOURCE

TAPE LABELLED CSYSNSRDCPL; P.F. NSRDCPL,10=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'BSJ'

PURPOSE
SPHERICAL BESSEL FUNCTION

FUNCTIONAL CATEGORY: C3

LANGUAGE: FORTRAN IV

REMARKS
EVALUATES THE SPHERICAL BESSEL FUNCTION J-SUB-N(X) FOR
N=-1,0,...,I BY MEANS OF A RECURSIVE RELATION AND REASONABLE
STARTING VALUES. STARTING VALUES ARE GENERATED WITHIN THE
SUBROUTINE.

USAGE
CALL BSJ (I, X, BJ)

DESCRIPTION OF PARAMETERS
I - HIGHEST ORDER DESIRED
X - SINGLE PRECISION FLOATING POINT VARIABLE
BJ - ARRAY DIMENSIONED AT LEAST I+2 FOR SOLUTIONS
(BJ(N+2) = J-SUB-N(X))

CM REQUIRED: 432B

METHOD
A. THE VALUES ARE COMPUTED BY USING THE RECURSION FORMULA:

$$J_{I-1}(X) + J_{I+1}(X) = 2I \frac{J_I(X)}{X}$$

IF $X > 20.5$, THE RECURSION IS FORWARD.
IF $X \leq 20.5$, THE RECURSION IS BACKWARD.
FOR VARIOUS RANGES ($X < 20.5$), AN UPPER LIMIT, NU, IS SET.
BJ(NU+1) IS THEN SET TO ZERO, AND THE RECURSION PROCESS
IS EXECUTED.

B. RANGE: THE FOLLOWING DOMAINS HAVE BEEN CAREFULLY CHECKED:
 $1 \leq X \leq 25$; $I \leq 25$. ERROR IS LESS THAN $\pm 5 \times 10^{-11}$. POSSIBLE
DOMAINS ARE: $0 \leq I < 25$ AND $0 < X \leq 100$. (CAUTION: FOR LARGER
DOMAINS, CHECK DIMENSIONING IN THE SUBROUTINE.)
NOTE: IF $I \gg X$, J-SUB-I(X) IS VERY SMALL.

REFERENCES
HANDBOOK OF MATHEMATICAL FUNCTIONS, AMS 55, NATIONAL BUREAU
OF STANDARDS.

ASSOCIATION OF COMPUTING MACHINERY, "GENERATION OF SPHERICAL
BESSEL FUNCTIONS", F. J. CORBATO AND J. L. URETSKY, JULY
1959, VOL. 6, NO. 3, PP. 366-375.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

COS SIN

OTHERS

NONE

AUTHORS

R L PEXTON - LAWRENCE RADIATION LABORATORY

D A WILBER - LAWRENCE RADIATION LABORATORY

DATE WRITTEN: 01/06/65 (RLP)

DATE(S) REVISED

11/65 (DAW)

LOCATION OF DECKS

SOURCE

TAPE LABELLED: CLIBRARYUP03

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'CENTER'

PURPOSE

CENTER A CHARACTER STRING WITHIN AN OUTPUT FIELD

FUNCTIONAL CATEGORY: M4

USAGE

CALL CENTER (IN, LIN, OUT, NOUTC, WORK)

DESCRIPTION OF PARAMETERS

IN - INPUT ARRAY CONTAINING CHARACTER STRING TO BE
CENTERED
(CHARACTER STRING STARTS IN POSITION 1 AND ENDS
WITH LAST NON-BLANK CHARACTER)
LIN - NUMBER OF WORDS IN 'IN'
OUT - OUTPUT ARRAY IN WHICH 'IN' IS TO BE CENTERED
NOUTC - NUMBER OF CHARACTERS IN 'OUT' WITHIN WHICH
'IN' IS TO BE CENTERED
WORK - WORK ARRAY WHOSE DIMENSION IS THE LARGER OF
A) 10 TIMES LIN
B) NOUTC + 10

REMARKS

USEFUL FOR CENTERING HEADINGS ON A PAGE. FOR INSTANCE,
IF 'THIS IS A HEADING' IS TO BE CENTERED FOR A 132-
COLUMN WIDE PAGE, THE FOLLOWING CAN BE USED:
DIMENSION IN(2), OUT(14), WORK(142)
IN(1) = 10HTHIS IS A
IN(2) = 10HHEADING
CALL CENTER (IN, 2, OUT, 132, WORK)
ON RETURN, 'OUT' WILL CONTAIN 'THIS IS A HEADING' IN
POSITIONS 58 THRU 74 (WORD 6, POSITION 8 THRU
WORD 8, POSITION 4). POSITIONS 1-56 AND 75-132 WILL
CONTAIN BLANKS.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

MOD MOVLEV SHIFT

OTHERS

VFILL - FILL ARRAY WITH SPECIFIED WORD

ARITHMETIC STATEMENT FUNCTIONS

FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

R11FMT	R12FMT	R13FMT	R14FMT	R15FMT
R16FMT	R17FMT	R18FMT	R19FMT	R110FMT

LANGUAGE: FORTRAN IV

CM REQUIRED: 333B

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

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DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'CHFILL'

PURPOSE

FILL (PORTION OF) ARRAY WITH CHARACTER

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

CALL CHFILL (ICHAR, TO, ITO, LEN)

DESCRIPTION OF PARAMETERS

ICHAR - FILL CHARACTER (1R OR 1H OR " ")

TO - ARRAY TO BE FILLED

ITO - STARTING CHARACTER IN 'TO'

(CHARACTER 1 IS LEFT-MOST CHARACTER OF TO(1))

LEN - NUMBER OF CHARACTERS TO BE FILLED

CM REQUIRED: 56B

EXAMPLE

TO: *****

AFTER CALL CHFILL (1R/, TO, 23, 7)

TO: *****//*****

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

AND SHIFT

OTHERS

PUTCHA - INSERT CHARACTER INTO ARRAY

ARITHMETIC STATEMENT FUNCTIONS

L11FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

R11FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 03/10/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'CMPINV'

PURPOSE

COMPLEX MATRIX INVERSION

FUNCTIONAL CATEGORIES: F4 A2

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

THE REAL AND/OR IMAGINARY PARTS OF THE MATRIX 'A' MAY BE SINGULAR.

USAGE

CALL CMPINV (A, N, N1, C, IO, E, N2, INDEX)

DESCRIPTION OF PARAMETERS

A - COMPLEX INPUT MATRIX
(NOT DESTROYED BY SUBROUTINE)
N - DIMENSION OF A AND C (N X N)
N1 - NUMBER OF ROWS IN A AND C CURRENTLY FULL
C - INVERSE RESULT MATRIX
(MAY BE THE SAME AS A)
IO - RETURN CODE
1 - INVERSION SUCCESSFUL
2 - MATRIX SINGULAR
E - TEMPORARY ARRAY SOLVING N2 X N2 SYSTEM
N2 - NO SMALLER THAN N1+N1
INDEX - TEMPORARY ARRAY USED IN INVERSION (N2,3)

THE CALLING PROGRAM MUST INCLUDE:

COMPLEX A(N,N), C(N,N)
REAL E(N2,N2), INDEX(N2,3)

CM REQUIRED: 1473

METHOD

THE SYSTEM SOLVED IS THE EXPANDED MATRIX

$$E = \begin{bmatrix} -AR & -AI \\ AI & AR \end{bmatrix}$$

WHERE CR IS TAKEN AS THE UPPER LEFT CORNER OF THE INVERSE AND CI IS TAKEN AS THE LOWER LEFT CORNER OF THE INVERSE. (LANCZOS, APPLIED ANALYSIS, P 137). THE INVERSE IS COMPUTED BY SUBROUTINE MATINS (ALSO ON NSRDC) WHICH USES GAUSS-JORDAN ELIMINATION. THIS METHOD FINDS AN INVERSE IF IT EXISTS, EVEN IF REAL AND IMAGINARY PARTS OF A ARE BOTH INDIVIDUALLY SINGULAR. IDENTIFICATION OF A SINGULAR COMPLEX MATRIX IS RETURNED TO THE CALLING PROGRAM.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE
 AIMAG CMPLX REAL
OTHERS
 MATINS - MATRIX INVERSION

AUTHOR
 SHARON E GOOD - DTNSRDC CODE 1892.2

DATE WRITTEN: 06/10/71

DATE(S) REVISED

LOCATION OF DECKS

 SOURCE

 TAPE LABELLED: CLIBRARYUPD3,D=HY (DECKNAME: AMCHAT)

 OBJECT

 EDITLIB USER LIBRARY: NSRDC

FUNCTION 'COMPSTR'

PURPOSE

COMPARE TWO CHARACTER STRINGS

FUNCTIONAL CATEGORY: M0

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

TEST = COMPSTR (A, FROMA, B, FROMB, NCHAR)

DESCRIPTION OF PARAMETERS

A - ARRAY CONTAINING FIRST CHARACTER STRING
FROMA - STARTING CHARACTER POSITION IN A
(POSITION 1 IS LEFT-MOST 6-BIT CHARACTER IN A(1))
B - ARRAY CONTAINING SECOND CHARACTER STRING
FROMB - STARTING CHARACTER POSITION IN B
(POSITION 1 IS LEFT-MOST 6-BIT CHARACTER IN B(1))
NCHAR - NUMBER OF CHARACTERS TO COMPARE
COMPSTR - WILL RETURN ONE OF:
-1. - STRING IN A IS LESS THAN STRING IN B
0. - STRING IN A IS EQUAL TO STRING IN B
+1. - STRING IN A IS GREATER THAN STRING IN B

CM REQUIRED: 105B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

GETCHA - GET CHARACTER FROM ARRAY

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 04/04/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'CONTRCT'

PURPOSE

SQUEEZE ARRAY OF 1R-FORMAT CHARACTERS TO LEFT

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

SEE SUBROUTINE 'EXPAND'.

USAGE

CALL CONTRCT (A, B, NCHAR)

DESCRIPTION OF PARAMETERS

A - INPUT ARRAY WHOSE ELEMENTS EACH CONTAIN ONE
CHARACTER IN THE RIGHT-MOST 6 BITS (1R FORMAT)
B - OUTPUT ARRAY WHOSE ELEMENTS WILL EACH CONTAIN 10
CHARACTERS FROM ARRAY A (ANY LEFT-OVER BITS OF THE
LAST WORD USED IN ARRAY B WILL BE CLEARED TO 09)
NCHAR - NUMBER OF CHARACTERS IN ARRAY A

CM REQUIRED: 558

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

OF LANGUAGE

MASK MOD

OTHERS

PUTCHA - INSERT CHARACTER INTO ARRAY

ARITHMETIC STATEMENT FUNCTIONS

NWORD - COMPUTE SUBSCRIPT

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 04/04/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'COUPLE'

PURPOSE

LOGICALLY CONNECT (PORTIONS OF) TWO WORDS

FUNCTIONAL CATEGORY: R1

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

CALL COUPLE (FL, AWORD, AB, BWORD, BB, LC, IOAC)

DESCRIPTION OF PARAMETERS

FL	- NUMBER OF BITS TO PROCESS	
AWORD	- FIRST WORD (FROM)	
AB	- STARTING BIT POSITION IN AWORD	
BWORD	- SECOND WORD (TO)	
BB	- STARTING BIT POSITION IN BWORD	
LC	- CODE FOR LOGICAL CONNECTIVE DESIRED	
	0 - PUT ZEROS INTO BWORD FIELD	(0)
	1 - AND THE FIELDS	(M.A)
	2 - AND THE COMPLEMENT OF A TO B	(M.A*)
	3 - NUMBER OF ONE IN THE LAST FIELD	(M)
	4 - AND THE COMPLEMENT OF B TO A	(M*.A)
	5 - SUBSTITUTE FIELD OF A INTO B	(A)
	6 - EXCLUSIVE OR	
	7 - OR	(M+A)
	8 - AND COMPLEMENTS	(A*.B*)
	9 - IDENTITY	(B=A)
	10 - SUBSTITUTE COMPLEMENT OF A INTO B	(A*)
	11 - OR THE COMPLEMENT OF A TO B	(M+A*)
	12 - COMPLEMENT OF B	(M*)
	13 - OR A TO THE COMPLEMENT OF B	(A+M*)
	14 - OR THE COMPLEMENTS OF A AND B	(A*+M*)
	15 - PUT ONES INTO BWORD FIELD	(1)
IOAC	- OUTPUT NUMBER OF ONE-BITS FOR LC=3	

CM REQUIRED: 2248

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

IAOC - COUNT ONE BITS IN A WORD

MASKIT - MULTIPLE-FIELD MASK GENERATOR

AUTHOR
NWL

DATE WRITTEN:

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'CPU467'
FUNCTION 'CPU467'

PURPOSE

OBTAIN THE MACHINE THE PROGRAM IS RUNNING ON

FUNCTIONAL CATEGORY: Q0

USAGE

CALL CPU467 (ICPU)
VARIABLE = CPU467 (ICPU)

DESCRIPTION OF PARAMETER

ICPU - WILL RETURN THE MACHINE THE PROGRAM IS RUNNING ON
(LEFT-ADJ, ZERO-FILLED)
(WILL RETURN ONE OF 4L6700, 4L6600, 4L6400)
(WHEN USED AS A FUNCTION, 'VARIABLE' AND 'CPU467'
MUST BE OF THE SAME TYPE)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

AND MACHINE OR SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

L3BFMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

GM REQUIRED: 258

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 04/18/75

DATE(S) REVISED

03/22/76 - MAKE FUNCTION AS WELL AS SUBROUTINE

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'DMPA'

PURPOSE

CALLABLE OCTAL AND CHARACTER DUMP OF SPECIFIED PORTION
OF USER'S FIELD LENGTH (FL) (BY ACTUAL LOCATION)
(NO HEADINGS ARE PROVIDED)

FUNCTIONAL CATEGORY: N2

USAGE

CALL DMPA (FWA, N, INIT)
CALL DMPA (FWA, N)

DESCRIPTION OF PARAMETERS

FWA - FIRST WORD ADDRESS OF AREA TO DUMP
(E.G., LOGF (ARRAY))
N - NUMBER OR WORDS TO DUMP
INIT - STARTING WORD ADDRESS TO BE PRINTED
(IF OMITTED, 0 IS USED)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF

OTHERS

EQJ60 - LOGICAL ARRAY COMPARE
MFETCH - READ WORD IN USER'S FL

LANGUAGE: FORTRAN IV

OUTPUT UNIT

UNIT #	LFN	USE
-----	-----	-----
	OUTPUT	LISTABLE OUTPUT

CM REQUIRED: 3159

AUTHOR

DAVID V SOMMER - DTNSROC CODE 1892.2

DATA WRITTEN: 06/14/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLB USER LIBRARY: NSRJC

SUBROUTINE 'DMPCPA'

PURPOSE

DUMP JOB CONTROL POINT AREA

FUNCTIONAL CATEGORY: N2

USAGE

CALL DMPCPA

REMARKS

OCTAL AND CHARACTER DUMP

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

DATE TIME

OTHERS

RCPA - READ CONTROL POINT AREA

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

OUTPUT UNITS

UNIT--#	--LEN--	-----USE-----
OUTPUT	LISTABLE OUTPUT	

CM REQUIRED: 3248

AUTHOR

DAVID V SOMMER - DTNSROC CODE 1892.2

DATE WRITTEN: 12/29/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSROCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'DMPFIT'

PURPOSE

SHORT DUMP OF FTN OR RM FILE INFORMATION TABLE (FIT)

FUNCTIONAL CATEGORY: N2

USAGE

CALL DMPFIT (FIT, RM)
CALL DMPFIT (FIT)

DESCRIPTION OF PARAMETERS

FIT - RM FIT ARRAY -OR-
FTN FILE NAME (L-FORMAT) OR INTEGER FORTRAN
LOGICAL UNIT NUMBER)
RM - IF OMITTED OR RM=0, FIT IS FOR FTN FILE.
IF RM≠0, FIT IS RM FIT ARRAY.

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCF MOVLEV SHIFT

OTHERS

ISTAPE - CHANGE INTEGER N TO 'TAPEN'
MFETCH - READ WORD IN USER'S FL

ARITHMETIC STATEMENT FUNCTIONS

FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

L61FMT

L71FMT

FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

R21FMT

R23FMT

R25FMT

R27FMT

R29FMT

R38FMT

LANGUAGE: FORTRAN IV

OUTPUT UNITS

FORTRAN LOCAL

LOGICAL FILE

U-N-I-I

NAME--

OUTPUT

-----USE-----
LISTABLE OUTPUT

CM REQUIRED: 233B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 11/04/75

DATE(S) REVISED

04/21/76

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

08/22/77

2-25

DMPFIT - 1 OF 1

SUBROUTINE 'DPROOT'

PURPOSE

FIND ALL ROOTS OF A REAL DOUBLE PRECISION POLYNOMIAL

FUNCTIONAL CATEGORY: C2 B4

LANGUAGE: FORTRAN IV

REMARKS

THE POLYNOMIAL HAS THE FORM:

$$A_1 + A_2 X + \dots + A_{N+1} X^{**N} = 0$$

USAGE

CALL DPROOT (N, A, U, V, H, B, C, CONV, NPLUS2)

DESCRIPTION OF PARAMETERS

- N - DEGREE OF THE POLYNOMIAL TO BE SOLVED
- A - DOUBLE PRECISION ARRAY (DIMENSIONED N+2) CONTAINING THE COEFFICIENTS IN THE ORDER INDICATED ABOVE
- U - DOUBLE PRECISION ARRAY (DIMENSIONED N+2) WHICH WILL CONTAIN THE REAL PARTS OF THE ROOTS
- V - DOUBLE PRECISION ARRAY (DIMENSIONED N+2) WHICH WILL CONTAIN THE IMAGINARY PARTS OF THE ROOTS
- H,B,C - DOUBLE PRECISION WORK ARRAYS (EACH DIMENSIONED N+2)
- CONV - CONVERGENCE CRITERION. INITIALLY SET BY DPROOT TO 1.00-35 (FAR BELOW THE ACTUAL STARTING CONVERGENCE CRITERION OF 5.00-20 (CDC 6600)). IF THE POLYNOMIAL HAS NOT CONVERGED AFTER A PRESCRIBED NUMBER OF TRIES, THE CONVERGENCE CRITERION IS RELAXED. IF, UPON EXIT FROM DPROOT, CONV IS NOT 1.00-35, THE CONVERGENCE CRITERION HAS BEEN RELAXED TO THE NUMBER GIVEN. (CONV IS DOUBLE PRECISION.)

NPLUS2 - MUST BE SET TO N+2

CM REQUIRED: 11538

METHOD

THE ROUTINE CONVERGES SIMULTANEOUSLY TOWARD A LINEAR FACTOR AND A QUADRATIC FACTOR BY NEWTON'S AND BAIRSTOW'S METHODS, RESPECTIVELY. WHEN A ROOT IS FOUND BY ONE METHOD, ITERATION CONTINUES WITH BOTH METHODS USING THEIR MOST RECENT GUESSES.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

DABS DSIGN SQRT

OTHERS

NONE

AUTHOR
HARVEY ABRAMSON - NEW YORK UNIVERSITY

DATE WRITTEN: 01/66

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED: CLIBRARYUPD3

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'DUMPA'

PURPOSE

GIVE OCTAL AND CHARACTER DUMP OF USER-SPECIFIED AREA

FUNCTIONAL CATEGORY: N2

USAGE

CALL DUMPA (AREA, NWORDS, NAME)

DESCRIPTION OF PARAMETERS

AREA - START OF AREA TO BE DUMPED

NWORDS - NUMBER OF WORDS TO DUMP

NAME - 1-10 CHARACTER IDENTIFICATION OF START OF AREA
(E.G., 10HMYAREA(1))
(WILL BE PRINTED IN HEADING LINE)

REMARKS

LINES CONTAIN 4 WORDS EACH. IF A LINE IS THE SAME AS THE
PREVIOUS LINE, IT IS NOT PRINTED (UNLESS IT IS THE LAST
LINE).

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

COMPL

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

OUTPUT UNITS

UNIT--1	--LEN--	-----USE-----
OUTPUT	LISTABLE OUTPUT	

CM REQUIRED: 2578

AUTHOR

DAVID V SOMMER - DTNSROC CODE 1892.2

DATE WRITTEN: 02/06/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'DUMPCPA'

PURPOSE

EXPANDED DUMP OF JOB CONTROL POINT AREA

FUNCTIONAL CATEGORY: N2

USAGE

CALL DUMPCPA

REMARKS

EACH FIELD IS PRINTED SEPARATELY

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

DATE SHIFT TIME

OTHERS

EXTBIT - EXTRACT BITS FROM A WORD

PAKLFT - SQUEEZE LEFT, REMOVE BLANKS AND 008

RCPA - READ CONTROL POINT AREA

VFILL - FILL ARRAY WITH WORD

ARITHMETIC STATEMENT FUNCTIONS

FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

L71FMT

FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

R1FMT R16FMT R19FMT R110FMT

R21FMT R23FMT R25FMT R27FMT

R31FMT R32FMT R34FMT R35FMT R36FMT

R38FMT

R41FMT R45FMT

R65FMT

R71FMT

LANGUAGE: FORTRAN IV

OUTPUT UNITS

UNIT--# --LEN-- --USE--
OUTPUT LISTABLE OUTPUT

CM REQUIRED: 44448

AUTHOR

DAVID V SOMMER - DTNSROC CODE 1892.2

DATE WRITTEN: 12/30/75

DATE(S) REVISED

02/27/76

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'DUMPFIT'

PURPOSE

DETAILED DUMP OF FTN OR RM FILE INFORMATION TABLE (FIT)

FUNCTIONAL CATEGORY: N2

USAGE

CALL DUMPFIT (FIT, RM)
CALL DUMPFIT (FIT)

DESCRIPTION OF PARAMETERS

FIT - RM FIT ARRAY -OR-
FTN FILE NAME (L-FORMAT) OR INTEGER FORTRAN
LOGICAL UNIT NUMBER
RM - IF OMITTED OR RM=0, FIT IS FOR FTN FILE.
IF RM#0, FIT IS RM FIT ARRAY.

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCB MOVLEV SHIFT

OTHERS

ISTAPE - CHANGE INTEGER N TO 'TAPEN'
MFETCH - READ WORD IN USER'S FL

ARITHMETIC STATEMENT FUNCTIONS

FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

L61FMT L71FMT

FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

R11FMT	R15FMT	R17FMT	R21FMT	R23FMT
R25FMT	R27FMT	R29FMT	R35FMT	R38FMT
R41FMT	R47FMT	R51FMT	R56FMT	R65FMT

LANGUAGE: FORTRAN IV

OUTPUT UNITS

FORTRAN LOCAL
LOGICAL FILE

U_N_I_I	NAME	USE
OUTPUT	LISTABLE OUTPUT	

CM REQUIRED: 3162B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 11/04/75

DATE(S) REVISED

04/21/76

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

08/22/77

2-30

DUMPFIT - 1 OF 1

SUBROUTINE 'DUMPFL'

PURPOSE

CALLABLE OCTAL AND CHARACTER DUMP OF SPECIFIED PORTION
OF USER'S FIELD LENGTH (FL) (BY ACTUAL LOCATION)

FUNCTIONAL CATEGORY: N2

USAGE

CALL DUMPFL ** SEE REMARK 1
CALL DUMPFL (LWA)
CALL DUMPFL (FWA, LWA)

DESCRIPTION OF PARAMETERS

FWA - FIRST WORD ADDRESS OF AREA TO DUMP
(SET TO ZERO IF ANY OF THE FOLLOWING:

- 1) FWA OMITTED;
- 2) FWA LESS THAN ZERO;
- 3) FWA GREATER THAN FL;
- 4) FWA GREATER THAN LWA)

LWA - LAST WORD ADDRESS OF AREA TO DUMP
(SET TO FL IF ONE OF THE FOLLOWING:

- 1) LWA OMITTED;
- 2) LWA LESS THAN OR EQUAL TO ZERO;
- 3) LWA GREATER THAN FL;
- 4) FWA GREATER THAN LWA)

REMARKS

- 1) WHEN CALLED WITHOUT AN ARGUMENT LIST, THE FTM CARD
FOR THE CALLING PROGRAM MUST HAVE THE 'Z' PARAMETER.
- 2) DUMP IS AT 8 LINES PER INCH ON PRINTERS WHICH WILL PRINT
AT THAT DENSITY.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE

LOGF

OTHERS

EQU60 - LOGICAL ARRAY COMPARE
FTNRFL - GET CURRENT FL
MFETCH - READ WORD IN USER'S FL

LANGUAGE: FORTRAN IV

OUTPUT UNITS

UNIT #	LFN	USE
-----	-----	-----
	OUTPUT	LISTABLE OUTPUT

CM REQUIRED: 4018

AUTHOR
DAVID V SOMMER - DTNSRDC CODE 1892.2

DATA WRITTEN: 03/12/76

DATE(S) REVISED
06/14/76

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLR USER LIBRARY: NSRDC

SUBROUTINE 'ELTIME'

PURPOSE

OBTAIN CPA, CPB, CP, PP, IO AND WALL CLOCK TIMES SINCE

FUNCTIONAL CATEGORY: Q0 NO

LAST CALL

USAGE

CALL ELTIME (TIMES)

DESCRIPTION OF PARAMETER

TIMES - 7-WORD ARRAY TO CONTAIN THE FOLLOWING:

- 1 - CPA TIME IN SECONDS
- 2 - CPB TIME IN SECONDS
- 3 - CP TIME IN SECONDS (CPA+CPB)
- 4 - PP TIME IN SECONDS
- 5 - IO TIME IN SECONDS
- 6 - WALL CLOCK TIME (HH.MM.SS.)
- 7 - WALL CLOCK TIME IN SECONDS

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

- IHMS - CONVERT SECONDS TO ' HH.MM.SS.'
- ISEC - CONVERT HH.MM.SS TO SECONDS
- RCPA - READ CONTROL POINT AREA

ARITHMETIC STATEMENT FUNCTIONS

R65FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

CM REQUIRED: 105B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 12/15/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'EQU60'

PURPOSE

LOGICAL COMPARE (OF 2 ARRAYS)

FUNCTIONAL CATEGORY: M0

USAGE

TEST = EQU60 (A, B, N)

TEST = EQU60 (A, B)

DESCRIPTION OF PARAMETERS

A,B - COMPARE (ARRAY) A WITH (ARRAY) B

N - NUMBER OF WORDS TO COMPARE

(IF OMITTED, N=1)

EQU60 - WILL RETURN ONE OF:

-1. IF A .LT. B (DISPLAY CODE)

0. IF A .EQ. B (DISPLAY CODE)

+1. IF A .GT. B (DISPLAY CODE)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 COMPASS

GM REQUIRED: 248

AUTHOR

C. FLINK - NWL - KPS

DATE WRITTEN: 12/08/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS (*DECK COMPAB)

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'EXPAND'

PURPOSE

EXPAND CHARACTER STRING INTO ARRAY OF 1R-FORMAT WORDS

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

SEE SUBROUTINE 'CONTRCT'.

USAGE

CALL EXPAND (A, B, NCHAR)

DESCRIPTION OF PARAMETERS

A - INPUT ARRAY CONTAINING THE CHARACTER STRING
B - OUTPUT ARRAY WHOSE ELEMENTS WILL EACH CONTAIN ONE
CHARACTER FROM ARRAY A IN 1R FORMAT
NCHAR - NUMBER OF CHARACTERS IN ARRAY A

CM REQUIRED: 40B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

GETCHA - GET CHARACTER FROM ARRAY

AUTHOR

DAVID V SOMMER - DTNSROC CODE 1892.2

DATE WRITTEN: 04/04/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'EXPRM'

PURPOSE

EXTRACT PARAMETER FROM CONTROL CARD

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

ON EACH CALL, THE NEXT PARAMETER IS PASSED FROM RA+703 TO WORD(S) IAD, LEFT JUSTIFIED, ZERO-FILLED. ONCE A TERMINATOR IS ENCOUNTERED OR THE END OF A CARD IS REACHED, ZERO IS RETURNED.

IF CALLED WITH THE SECOND ARGUMENT, RETURNED IN ICC WILL BE A CODE INDICATING THE TYPE OF THE SEPARATOR FOUND FOLLOWING THE PARAMETER RETURNED IN IAD.

USAGE

CALL EXPRM (IAD)
CALL EXPRM (IAD, ICC)

DESCRIPTION OF PARAMETERS

IAD - WILL CONTAIN THE NEXT PARAMETER FROM THE CONTROL CARD. IF TERMINATOR OR END OF CARD, 0 IS RETURNED.

ICC - IF PRESENT, WILL CONTAIN A CODE INDICATING THE TYPE OF SEPARATOR ENCOUNTERED

DEC	OCT	SEPARATOR
1	1	,
2	2	=
3	3	/
4	4	(
5	5	+
6	6	-
7	7	BLANK
8	108	;
14	168	OTHER
15	178	. OR) (TERMINATOR)

GM REQUIRED: V3358

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCFL SHIFT

OTHERS

MFETCH - FETCH WORD IN USER'S FL

AUTHOR
C FLINK - KPS - NWL

DATE WRITTEN: 06/73

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'EXTBIT'

PURPOSE

EXTRACT BITS FROM A WORD

FUNCTIONAL CATEGORY: M4

USAGE

CALL EXTBIT (ISTART, NBITS, IN, IOUT, IRC)

DESCRIPTION OF PARAMETERS

ISTART - FIRST/ONLY BIT TO EXTRACT

(BITS ARE NUMBERED 53-0)

NBITS - NUMBER OF BITS TO EXTRACT (1-60)

IN - INPUT WORD FROM WHICH BITS ARE TO BE EXTRACTED

OUT - OUTPUT ARRAY OF DIMENSION NBITS

IRC - RETURN CODE

0 - NO ERROR

1 - ISTART OUT OF RANGE (MUST BE 0-59)

2 - NBITS OUT OF RANGE (MUST BE 1-60)

3 - BOTH ISTART AND NBITS OUT OF RANGE

REMARKS

IF NBITS GOES PAST THE END OF THE WORD, EXTBIT WILL FILL
WITH ZEROS. THERE IS NO CHECK FOR THIS.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

MAX0

MIN0

MASK

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

GM REQUIRED: 44B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 12/09/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'EXTPRM'

PURPOSE

EXTRACT NEXT PARAMETER FROM USER-SUPPLIED PARAMETER STRING

FUNCTIONAL CATEGORY: M4

USAGE

CALL EXTPRM (IAREA, LAREA, IPARM, ISEP)
CALL EXTPRM (IAREA, LAREA, IPARM)
CALL EXTPRM (0 , LAREA)
CALL EXTPRM (0)

DESCRIPTION OF PARAMETERS

IAREA - IN - ARRAY CONTAINING PARAMETER STRING

LAREA - IN - NUMBER OF WORDS IN 'IAREA'

OUT - FIRST AND SECOND FORMS OF CALL ONLY:

0 IF END OF 'IAREA' REACHED

THIRD FORM OF CALL:

INITIALIZE FOR THIS MANY WORDS

FOURTH FORM OF CALL (OMITTED):

INITIALIZE FOR 16 WORDS

(BECAUSE 'LAREA' IS BOTH AN INPUT AND OUTPUT ARGUMENT, IT MUST ALWAYS BE USED AS A VARIABLE, NEVER AS AN EXPLICIT INTEGER.)

IPARM - OUT - NEXT PARAMETER, LEFT-JUSTIFIED, ZERO-FILLED

ISEP - OUT - IF PRESENT, CODE INDICATING TYPE OF SEPARATOR FOUND FOLLOWING THE PARAMETER RETURNED IN 'IPARM' (COMPATIBLE WITH SCOPE 3.3 AND 3.4)

DEC OCT SEPARATOR

1 01 ,

2 02 =

3 03 /

4 04 (

5 05 +

6 06 -

7 07 BLANK

8 10 ;

14 16 OTHER

15 17 . OR) (TERMINATOR)

REMARKS

THE SUBROUTINE IS PRE-INITIALIZED FOR PROCESSING THE FIRST USER PARAMETER STRING. IF A SECOND STRING IS TO BE PROCESSED, THE SUBROUTINE MUST BE RE-INITIALIZED USING EITHER THE THIRD OR FOURTH FORM OF THE CALL.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCF

MINO

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS
NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 4648

AUTHORS

C FLINK - KPS NWL
D V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 06/73 - CF

DATE(S) REVISED

04/11/74 - DVS - ORIGINAL SUBROUTINE 'EXPRM' MODIFIED TO
ACCEPT USER-SUPPLIED PARAMETER STRING

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'FBINRD'

PURPOSE

UNPACK AN INPUT ARRAY

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

CALL FBINRD (BW, NUMB, IN, OUT)

DESCRIPTION OF PARAMETERS

BW - BITS-PER-WORD TO BE EXTRACTED

NUMB - NUMBER OF BW-BIT OUTPUT WORDS DESIRED

DIMENSION OF IN IS ((NUMB*BW)+59)/60

DIMENSION OF OUT IS NUMB

IN - INPUT ARRAY

OUT - OUTPUT ARRAY

CM REQUIRED: 35B

METHOD

THE BW EXTRACTED BITS ARE RIGHT JUSTIFIED WITH LEADING
ZEROS IN OUT.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

AUTHOR

A. CINCOTTA - DTNSRDC CODE 1892.3

DATE WRITTEN: 03/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'FFT5'

PURPOSE

FAST FOURIER TRANSFORM

FUNCTIONAL CATEGORY: E2

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

CALL FFT5 (F, NPTS, KOMPLX)

DESCRIPTION OF PARAMETERS

F - (COMPLEX) ARRAY TO BE TRANSFORMED
(IF 'F' IS REAL, THE VALUES MUST BE STORED IN
CONTIGUOUS CORE LOCATIONS)
NPTS - NUMBER OF WORDS IN 'F' TO BE TRANSFORMED.
MUST BE POWER OF 2 AND LE 8192.
TO COMPUTE THE INVERSE TRANSFORM, NPTS MUST
BE NEGATIVE.
KOMPLX - ONE OF:
0 - DATA IN 'F' IS REAL
1 - DATA IN 'F' IS COMPLEX

CM REQUIRED: 45219 (FFT5) (+ 2309 FOR IRVING)

METHOD

SEE CMD-25-71

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

COS FLOAT IABS

PART OF PROGRAM

IRVING

OTHERS

NONE

AUTHORS

W. H. HAILE

GEORGE GLUCK

DATE WRITTEN: 1971

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED CLIBRARYU03 (DECK: AMFFT5)

OBJECT

EDITLIB USER LIBRARY: NSR00

SUBROUTINE 'FINDC'

PURPOSE

FIND PRESENCE OR ABSENCE OF SPECIFIED CHARACTER IN AN ARRAY
(USER SPECIFIES RELATIONAL OPERAND)

FUNCTIONAL CATEGORY: M5

USAGE

CALL FINDC (A, NA, CHAR, NC, NW, REL, FIRSTCH)
CALL FINDC (A, NA, CHAR, NC, NW, REL)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SEARCHED
NA - NUMBER OF WORDS IN 'A' TO BE SEARCHED
CHAR - CHARACTER TO BE SEARCHED FOR ACCORDING TO 'REL'
(LEFT-ADJ, BLANK- OR ZERO-FILLED -OR-
RIGHT-ADJ, ZERO-FILLED)
NC - OUTPUT POSITION OF FIRST CHARACTER (RELATIVE TO
START OF 'A') WHICH SATISFIES THE RELATION
'REL' -OR-
0 - CONDITION IS NOT SATISFIED -OR-
-1 - 'REL' IS INVALID
-2 - 'FIRSTCH' GT 10*NA
NW - OUTPUT SUBSCRIPT OF WORD CONTAINING POSITION
'NC' -OR-
0 - CONDITION IS NOT SATISFIED -OR-
-1 - 'REL' IS INVALID
-2 - 'FIRSTCH' GT 10*NA
REL - RELATIONAL OPERAND
"EQ" - FIND FIRST CHARACTER IN 'A' EQUAL TO
'CHAR'
"NE" - FIND FIRST CHARACTER IN 'A' NOT EQUAL TO
'CHAR'
"LT" - FIND FIRST CHARACTER IN 'A' LESS THAN
'CHAR'
"LE" - FIND FIRST CHARACTER IN 'A' LESS THAN OR
EQUAL TO 'CHAR'
"GT" - FIND FIRST CHARACTER IN 'A' GREATER THAN
'CHAR'
"GE" - FIND FIRST CHARACTER IN 'A' GREATER THAN
OR EQUAL TO 'CHAR'
FIRSTCH - FIRST CHARACTER TO BE SEARCHED (OPTIONAL)
(DEFAULT: 1)
IF FIRSTCH < 1, DEFAULT IS USED.

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE

LOCF

OTHERS

GETCHA - GET CHARACTER FROM ARRAY

ARITHMETIC STATEMENT FUNCTIONS

L11FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

L21FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

R11FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

CM REQUIRED: 261B

AUTHORS

DAVID V SOMMER - DTNSRDC CODE 1892.2

PETE ROTH - DTNSRDC CODE 1720.3

DATA WRITTEN: 04/20/76

DATE(S) REVISED

07/22/76 - PR/DVS - ADD PARAMETER 'FIRSTCH'

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'FINDW'

PURPOSE

FIND PRESENCE OR ABSENCE OF SPECIFIED WORD IN AN ARRAY
(USER SPECIFIES RELATIONAL OPERAND)

FUNCTIONAL CATEGORY: M5

USAGE

CALL FINDW (A, NA, W, NW, REL)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SEARCHED
NA - NUMBER OF WORDS IN 'A' TO BE SEARCHED
W - WORD TO BE TESTED FOR ACCORDING TO 'REL'
NW - OUTPUT POSITION (SUBSCRIPT) OF FIRST WORD IN 'A'
WHICH SATISFIES THE RELATION 'REL' -OR-
0 - CONDITION IS NOT SATISFIED -OR-
-1 - 'REL' IS INVALID
REL - RELATIONAL OPERAND
"EQ" - FIND FIRST WORD IN 'A' WHICH IS EQUAL TO 'W'
"NE" - FIND FIRST WORD IN 'A' WHICH IS NOT EQUAL TO
'W'
"LT" - FIND FIRST WORD IN 'A' WHICH IS LESS THAN 'W'
"LE" - FIND FIRST WORD IN 'A' WHICH IS LESS THAN OR
EQUAL TO 'W'
"GT" - FIND FIRST WORD IN 'A' WHICH IS GREATER THAN
'W'
"GE" - FIND FIRST WORD IN 'A' WHICH IS GREATER THAN
OR EQUAL TO 'W'

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 201B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 02/20/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'FINDWRD'

PURPOSE

FIND SPECIFIED WORD IN AN ARRAY

FUNCTIONAL CATEGORY: M5

USAGE

CALL FINDWRD (A, NA, WORD, NWORD)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SEARCHED
NA - NUMBER OF WORDS IN 'A' TO BE SEARCHED
WORD - WORD TO BE SEARCHED FOR
NWORD - OUTPUT SUBSCRIPT OF FIRST OCCURRENCE OF WORD
IN 'A' (IF NO MATCH, ZERO (0) IS RETURNED)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 409

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 07/08/74

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'FRESNEL'

PURPOSE

EVALUATE FRESNEL INTEGRALS

FUNCTIONAL CATEGORY: C3

LANGUAGE: FORTRAN IV

REMARKS

$C(X) = \text{INTEGRAL (FROM 0 TO X) } \cos((\pi/2)U^2) dU$

$S(X) = \text{INTEGRAL (FROM 0 TO X) } \sin((\pi/2)U^2) dU$

RELATIVE ERROR < 2.E-10.

USAGE

CALL FRESNEL (X, C, S)

DESCRIPTION OF PARAMETERS

X - REAL INPUT PARAMETER

C - REAL OUTPUT PARAMETER (C(X))

S - REAL OUTPUT PARAMETER (S(X))

CM REQUIRED: 2719

METHOD

TRUNCATED CHEBYSHEV SERIES

REFERENCE

BULIRSCH, R., "NUMERICAL CALCULATION OF THE SINE, COSINE AND FRESNEL INTEGRALS", NUMERISCHE MATHEMATIK, 9, 1967, PP. 380-385.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

ABS	AIN	COS	FLOAT	SIN
OTHERS				
NONE				

AUTHOR

R BULIRSCH - UNIVERSITY OF CALIFORNIA AT SAN DIEGO

DATE WRITTEN: 01/68

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED: CLIBRARYUPD3

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'FTNRFL'

PURPOSE

GET/SET CORE SIZE

FUNCTIONAL CATEGORY: Q0

USAGE

CALL FTNRFL (IFL)

DESCRIPTION OF PARAMETER

IFL - INTEGER FIELD LENGTH DESIRED.

IF THE VALUE OF IFL IS ZERO (0), THE FL IS NOT CHANGED
BUT THE PRESENT FIELD LENGTH IS RETURNED IN IFL.

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 20B

AUTHOR

G FLINK - KPS NWL

DATE WRITTEN: 12/18/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSROCPL, ID=GSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'GAMCAR'

PURPOSE

COMPLEX GAMMA FUNCTION OF A COMPLEX ARGUMENT HAVING POSITIVE
REAL PART

FUNCTIONAL CATEGORY: C3

LANGUAGE: FORTRAN IV

REMARKS

HAS BEEN CHECKED FOR $CX = A + BI$, $0 < A \leq 20$, $0 < B \leq 20$.
RELATIVE ERROR IS $\leq 2 \cdot 10^{-10}$.

USAGE

COMPLEX CX, CY, GAMCAR

...
CY = GAMCAR (CX)

DESCRIPTION OF PARAMETERPS

CX - COMPLEX VARIABLE WITH POSITIVE REAL PART
CY - COMPLEX SOLUTION

GM REQUIRED: 233B

METHOD

$$\text{GAMCAR}(Z+1) = (Z+5.5)^{(Z+1/2)} * \\ E^{-(Z+5.5)} * \\ \text{SQRT}(2*PI) * \\ (\text{CONSTANT} + \text{SUM}(I=1,6) (CI/Z+I))$$

WHERE CONSTANT = 1.00000 00001 78
C(1) = 76.18009 17294 06
C(2) = -86.50532 03271 12
C(3) = 24.01409 82222 3
C(4) = -1.23173 95161 4
C(5) = 0.00120 85800 3
C(6) = -0.00000 53638 2

REFERENCES

C. LANCZOS, NUMERICAL ANALYSIS, SIAM SERIES B, VOL I, PP.
86-96, 1964.

HANDBOOK OF MATHEMATICAL FUNCTIONS, NATIONAL BUREAU OF
STANDARDS, APPLIED MATHEMATICS SERIES NO. 55.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

CEXP CLOG

OTHERS

NONE

AUTHORS

R L PEXTON - LAWRENCE RADIATION LABORATORY
D A WILBER - LAWRENCE RADIATION LABORATORY

DATE WRITTEN: 12/16/64 (RLP)

DATE(S) REVISED
08/65 (DAW)

LOCATION OF DECKS

SOURCE

TAPE LABELLED: CLIBRARYUPD3

OBJECT

NSRDC

FUNCTION 'GAMMA'

PURPOSE

INCOMPLETE GAMMA FUNCTION

FUNCTIONAL CATEGORY: C3

LANGUAGE: FORTRAN IV

REMARKS

COMPUTES GAMMA (A, X) UNDER THE FOLLOWING RESTRICTIONS:

1) $X \geq 0$,

2) WHEN $X = 0$, A IS NOT A NON-NEGATIVE INTEGER.

USAGE

Y = GAMMA (A, X)

DESCRIPTION OF PARAMETERS

A - INTEGER ≥ 0

X - ≥ 0 (X=0 FOR COMPLETE GAMMA FUNCTION)

CM REQUIRED: 5573 (INCLUDES GAMNEG/GCHEB/GFRAC/GSERIES)

REFERENCE

C. E. FROBERG, RATIONAL CHEBYCHEV APPROXIMATION OF
ELEMENTARY FUNCTIONS, BIT, VOL. 1, P. 256, 1961.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

ABS ALOG SQRT

PART OF PROGRAM

GAMNEG - COMPUTES GAMMA(A,X) WHEN A IS NEGATIVE INTEGER
(DUE TO THE REPRESENTATION OF NUMBERS IN THE
6600, IF $A = -N \pm E$, WHERE $E < 1.0E-10$, THEN A IS
TAKEN TO BE A NEGATIVE INTEGER)

GCHEB - COMPUTES BY A RATIONAL CHEBYSHEV APPROXIMATION
(GAMMA(A))

GFRAC - COMPUTES THE CONTINUED FUNCTION FOR GAMMA(A,X)

GSERIES - COMPUTES SUM $(N=0, \infty) ((-X)^N / ((A+N)N!))$

OTHERS

NONE

AUTHOR

HARVEY ABRAMSON - NEW YORK UNIVERSITY

DATE WRITTEN: 05/15/66

DATE(S) REVISED

05/67

LOCATION OF DECKS

SOURCE

TAPE LABELLED: CLIBRARYUPD3

OBJECT

NSRDC

SUBROUTINE 'GAUSS'

PURPOSE

GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING FOR SOLVING
AX=B WHERE B MAY BE A SYSTEM OF M RIGHT-HAND SIDES

FUNCTIONAL CATEGORIES: F4 F3

LANGUAGE: FORTRAN IV

REMARKS

IF A-INVERSE IS DESIRED; ANX={B IN} WILL YIELD
THE SOLUTION TO AX=B AS WELL AS THE INVERSE.

IF MM=0, XX CONTAINS RESULT OF FIRST GAUSSIAN ELIMINATION.

USAGE

CALL GAUSS (N, M, AA, BB, XX, VAL2, DET, MM)

DESCRIPTION OF PARAMETERS

N - SIZE OF MATRIX AA
M - NUMBER OF COLUMNS IN BB (≤ 51)
(NUMBER OF RIGHT HAND SIDES)
AA - MATRIX (51X51)
BB - RIGHT HAND SIDE(S) (51X51)
XX - SOLUTION VECTORS (51X51)
VAL2 - FINAL MAXIMUM ROW SUM OF RESIDUALS
(INFINITY-NORM OF RESIDUAL)
DET - DETERMINANT
MM - NUMBER OF ITERATIONS ON RESIDUALS
INPUT - MAXIMUM NUMBER TO BE PERMITTED
OUTPUT - NUMBER ACTUALLY DONE

CM REQUIRED: 17714B

REFERENCE:

WILKINSON, J. H., ROUNDING ERRORS IN ALGEBRAIC PROCESSES.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

ABS
OTHERS
NONE

AUTHORS

ROBERT MARGOLIS - UNIVERSITY OF MARYLAND
SUSAN VOIGHT - DTNSRDC

DATE WRITTEN: 1971

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED: CLIBRARYUPD3 (DECKNAME: AMGAU2)

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'GETCHA'
FUNCTION 'GETCHA'

PURPOSE

EXTRACT CHARACTER FROM SPECIFIED POSITION IN AN ARRAY

FUNCTIONAL CATEGORIES: M4 M5

USAGE

CALL GETCHA (A, N, CH)
VARIABLE = GETCHA (A, N, CH)

DESCRIPTION OF PARAMETERS

A - ARRAY FROM WHICH CHARACTER IS TO BE EXTRACTED
N - POSITION OF CHARACTER TO BE EXTRACTED
(POSITION 1 IS LEFT-MOST 6-BIT CHARACTER IN A(1))
CH - WILL CONTAIN THE EXTRACTED CHARACTER IN 1R FORMAT
(WHEN USED AS A FUNCTION, GETCHA WILL CONTAIN THE SAME
AS CH)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE
MOD SHIFT
OTHERS
NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

GM REQUIRED: 528

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 03/16/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'GETCHR'
FUNCTION 'GETCHR'

PURPOSE

EXTRACT CHARACTER FROM SPECIFIED POSITION IN A WORD

FUNCTIONAL CATEGORIES: M4 M5

USAGE

CALL GETCHR (A, N, CH)
VARIABLE = GETCHR (A, N, CH)

DESCRIPTION OF PARAMETERS

A - WORD FROM WHICH CHARACTER IS TO BE EXTRACTED
N - POSITION OF CHARACTER TO BE EXTRACTED
(POSITION 1 IS LEFT-MOST 6-BIT CHARACTER IN A)
CH - WILL CONTAIN THE EXTRACTED CHARACTER IN 1H FORMAT
(WHEN USED AS A FUNCTION, GETCHR WILL CONTAIN THE SAME
AS CH)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 43B

AUTHOR

FROM BIMED PACKAGE

DATE WRITTEN:

DATE(S) REVISED

1975 - DAVID V SOMMER - DTNSRDC CODE 1892.2

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'GETFIT'

PURPOSE

GET SPECIFIED FIT ADDRESS

FUNCTIONAL CATEGORY: Q0

USAGE

CALL GETFIT (LFN, ADDR)

DESCRIPTION OF PARAMETERS

LFN - LOCAL FILE NAME
(LEFT-JUSTIFIED, ZERO-FILLED)
(E.G., 5LTAPE1)

ADDR - WILL CONTAIN THE FIT ADDRESS

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: COMPASS

CM REQUIRED: 258

AUTHOR

ANTHONY CINCOTTA - NSRDC CODE 1892.3

DATE WRITTEN: 03/20/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'GETHOUR'

PURPOSE

FOR A SPECIFIED PERIOD OF TIME (UP TO 2 HR 59 MIN 59 SEC)
DETERMINE WHICH HOUR IS OCCUPIED THE LONGEST

FUNCTIONAL CATEGORY: M2

USAGE

CALL GETHOUR (FROM, TO, HOUR)

DESCRIPTION OF PARAMETERS

FROM - STARTING TIME ('HH.MM.SS ', ' HH.MM.SS ' OR
 ' HH.MM.SS')
TO - STOPPING TIME (SAME FORMAT AS 'FROM')
HOUR - WILL CONTAIN AN INTEGER HOUR
 0 - TIME PERIOD TOO LONG TO DETERMINE HOUR
 N - MOST/ALL TIME IS IN THE HOUR N-1 TO N
 (E.G., HOUR=8 MEANS MOST/ALL TIME IS IN
 THE HOUR 7-8)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

AND SHIFT

OTHERS

ISEC - CONVERT HH.MM.SS TO SECONDS

ARITHMETIC STATEMENT FUNCTIONS

I21FMT - FAST I-FORMAT DECODE

L11FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

METHOD

THE HOURS IN FROM (HF) AND TO (HT) ARE COMPARED.

IF EQUAL, HOUR IS SET TO HT+1.

IF THE DIFFERENCE IS 1, THE AMOUNT OF TIME SPENT IN EACH
HOUR IS COMPARED AND THE HOUR IS SET TO THE LARGER+1.

IF AN EQUAL AMOUNT OF TIME IS SPENT IN EACH HOUR, HOUR IS
SET TO HT+1.

IF THE DIFFERENCE IS 2, HOUR IS SET TO THE MIDDLE HOUR+1.

CM REQUIRED: 121B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 07/23/76

DATE(S) REVISED

11/16/76

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'GETLFNS'

PURPOSE

GET ACTUAL LOCAL FILE NAMES (FOR FTN)

FUNCTIONAL CATEGORY: 00

USAGE

CALL GETLFNS (LFN, NLFN)

CALL GETLFNS (LFN)

DESCRIPTION OF PARAMETERS

LFN - ARRAY DIMENSIONED AT LEAST 1 GREATER THAN
NUMBER OF FILES ON FTN PROGRAM STATEMENT

(ARRAY(NLFN) WILL BE SET TO 0)

NLFN - IF PRESENT, WILL RETURN NUMBER OF FILE NAMES + 1

REMARKS

USEFUL ONLY IN PROGRAMS WHICH ALLOW FILE NAME REPLACEMENT
IN THE 'LGO' CARD.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

MFETCH - GET WORD IN USER'S F.

LANGUAGE: FORTRAN IV

METHOD

FILE NAMES FROM PROGRAM CARD ARE IN RA+2 ON. EACH HAS A
POINTER TO ITS FIT. THE FIRST WORD OF EACH FIT IS THE
ACTUAL FILE NAME. THE LIST, STARTING IN RA+2, ENDS IN A
WORD OF ZEROS.

EXAMPLES

PROGRAM SAMPLE (INPUT, OUTPUT, TAPE1)

DIMENSION LFN(4)

CALL GETLFNS (LFN, NLFN)

...

EXECUTE CARD:

LGO.

LGO,,OUT,TAPE6.

AFTER CALL:

LFN(1) = 5LINPUT

LFN(1) = 5LINPUT

LFN(2) = 6LOUTPUT

LFN(2) = 3LOUT

LFN(3) = 5LTAPE1

LFN(3) = 5LTAPE6

LFN(4) = 0

LFN(4) = 0

NLFN = 4

NLFN = 4

CM REQUIRED: 548

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 12/30/74

DATE(S) REVISED

12/29/75

LOCATION OF DECKS

SOURCE: TAPE LABELLED CSYSNSRDCPL; P.F. NSRDCPL, ID=CSYS

OBJECT: EDITLIB USER LIBRARY: NSRDC

08/22/77

2-58

GETLFNS - 1 OF 1

SUBROUTINE 'GETLGO'

PURPOSE

EXTRACT FIRST 10 CHARACTERS OF ALL EXECUTE CARD
PARAMETERS

FUNCTIONAL CATEGORY: Q0

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

CALL GETLGO (LGO, NLGO)

DESCRIPTION OF PARAMETERS

LGO - ARRAY TO CONTAIN EXECUTE CARD PARAMETERS
LGO(1) CONTAINS EXECUTE NAME
LGO(2)-LGN(NLGO) CONTAIN FIRST 10 CHARACTERS
OF EACH PARAMETER (0 MEANS PARAMETER OMITTED)
NLGO - NUMBER OF WORDS OF LGO FILLED

CM REQUIRED: 36B

METHOD

PARAMETERS ARE EXTRACTED FROM RA+70B THRU RA+77B.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

EXPRM - GET NEXT PARAMETER FROM EXECUTE CARD

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 09/01/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'GETRA'

PURPOSE

GET FIRST 1008 WORDS OF USER'S FL

FUNCTIONAL CATEGORY: K2

LANGUAGE: CDC 6000 CP COMPASS

REMARKS

NONE

USAGE

CALL GETRA (RA)

DESCRIPTION OF PARAMETER

RA - 64-WORD ARRAY TO HOLD FIRST 1008 WORDS OF FL

CM REQUIRED: 7B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 10/03/73

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'GODROP'

PURPOSE

CREATE GO/DROP MESSAGE AND PROCESS RESPONSE

FUNCTIONAL CATEGORY: 00

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NOT DESIGNED FOR BATCH JOBS.

IN INTERCOM, WILL GENERATE MESSAGE AT THE TERMINAL, NOT AT THE CENTRAL SITE CONSOLE.

WHEN USED WITH NO ARGUMENT LIST, THE 'Z' PARAMETER MUST BE USED ON THE FTM CARD.

USAGE

CALL GODROP (MESSAGE)
CALL GODROP

DESCRIPTION OF PARAMETER

MESSAGE - IF USED, CONTENTS WILL BE DISPLAYED (SHOULD BE A ZERO-BYTE TERMINATED FIELD)
IF OMITTED, THE MESSAGE IS TAKEN FROM RA+703 THRU RA+77B AND PREFIXED WITH 'GO/DROP- '. THE MESSAGE MAY BE INSERTED BY
'CALL PUTRA (MESSAGE, 70B, 76B)'

CM REQUIRED: 142B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF REMARK

OTHERS

MFETCH - READ A WORD IN USER'S FL
MSET - SET WORD IN USER'S FL

AUTHOR

C FLICK - KPS NWL

DATE WRITTEN: 06/73

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'HERE'
FUNCTION 'HERE'

PURPOSE
GET TERMINAL ID FOR THIS JOB

FUNCTIONAL CATEGORY: Q0

USAGE
CALL HERE (I)
VARIABLE = HERE (I)

DESCRIPTION OF PARAMETERS
I - WILL CONTAIN THE TERMINAL ID, LEFT-JUSTIFIED,
ZERO-FILLED (1LC = CENTRAL SITE)
(WHEN USED AS A FUNCTION, 'HERE' WILL CONTAIN THE SAME AS
'I'. 'VARIABLE' AND 'HERE' MUST BE OF THE SAME TYPE.)

REMARKS
NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE
AND SHIFT
OTHERS
RCPA - READ CONTROL POINT AREA

ARITHMETIC STATEMENT FUNCTIONS
L25FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

METHOD
THE TERMINAL ID IS TAKEN FROM CONTROL POINT AREA.
IF THIS FIELD IS ZERO, IT IS A CENTRAL SITE JOB. IN THIS
CASE, 1LC IS RETURNED.

CM REQUIRED: 31B

AUTHOR
DAVID V SOMMER - DTNSROC CODE 1892.2

DATE WRITTEN: 12/05/75

DATE(S) REVISED

LOCATION OF DECKS
SOURCE
UPDATE LIBRARY: NSROCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSROC

FUNCTION 'IAOC'

PURPOSE

COUNT ONE-BITS IN SPECIFIED WORD

FUNCTIONAL CATEGORY: G6

LANGUAGE: CDC 6000 CP COMPASS

REMARKS

NONE

USAGE

N = IAOC (I)

DESCRIPTION OF PARAMETERS

I - WORD TO BE PROCESSED

IAOC - NUMBER OF ONE-BITS

CM REQUIRED: 2B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

AUTHOR

FROM NWL

DATE WRITTEN:

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'IBUNP'

PURPOSE

UNPACK 12-BIT BYTES FROM ARRAY

FUNCTIONAL CATEGORY: M4

LANGUAGE: CDC 6000 CP COMPASS

REMARKS

NONE

USAGE

CALL IBUNP (A1, A2, N)

DESCRIPTION OF PARAMETERS

A1 - INPUT ARRAY FROM WHICH BYTES ARE UNPACKED

A2 - OUTPUT ARRAY INTO WHICH BYTES ARE PLACED,
1 BYTE PER WORD, RIGHT JUSTIFIED, WITH LEADING ZEROS

N - NUMBER OF CDC WORDS TO UNPACK

DIMENSION OF A1 IS N

DIMENSION OF A2 IS 5*N

CM REQUIRED: 12B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

AUTHOR

FROM NWL

DATE WRITTEN:

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'IDAYWEK'

PURPOSE

DETERMINE THE DAY OF THE WEEK FOR ANY DATE FROM 10/15/1582
THRU 02/28/4000

FUNCTIONAL CATEGORY: G6

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

IDAY = IDAYWEK (IDATE, ICENT)

IDAY = IDAYWEK (IDATE)

DESCRIPTION OF PARAMETERS

IDATE - DATE TO BE PROCESSED ('MM/DD/YY ' OR ' MM/DD/YY '
OR ' MM/DD/YY ')

(IF IDATE = 0, TODAY'S DATE WILL BE USED; IDATE
WILL BE SET TO TODAY'S DATE ' MM/DD/YY ')

ICENT - CENTURY (E.G., 1900)

IF OMITTED, 1900 IS ASSUMED.

IDAYWEK - WILL CONTAIN THE DAY OF THE WEEK IN A-FORMAT
(E.G., 'SUNDAY ')

CM REQUIRED: 1043

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

AND DATE LOCF SHIFT

OTHERS

WEKDAY - DETERMINE DAY OF WEEK

ARITHMETIC STATEMENT FUNCTIONS

FAST I-FORMAT DECODE

I21FMT I24FMT I27FMT

FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

L11FMT

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 04/06/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'IDID'
FUNCTION 'IDID'

PURPOSE

GET USER INITIALS (AND INTERCOM USER ID) FROM CHARGE CARD
OR LOGIN

FUNCTIONAL CATEGORY: Q0

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

IF USER INITIALS AND USER ID ARE EQUAL, IT IS A BATCH JOB.

USAGE

CALL IDID (ID, IUSERID)
CALL IDID (ID)
IID = IDID (ID, IUSERID)
IID = IDID (ID)

DESCRIPTION OF PARAMETERS

ID - WILL CONTAIN 4-CHARACTER USER INITIALS FROM
CHARGE CARD OR START OF LOGIN
IUSERID - WILL CONTAIN 4-CHARACTER USER INITIALS FROM
CHARGE CARD OF UP TO 10-CHARACTER USER ID
FROM LOGIN
(IF ID = IUSERID, IT IS A BATCH JOB)
WHEN USED AS A FUNCTION, THE CONTENTS OF ID IS ALSO RETURNED
AS THE FUNCTION VALUE.

CM REQUIRED: 278

METHOD

THE ID IS TAKEN FROM THE CONTROL POINT AREA.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF

OTHERS

RCPA - READ CONTROL POINT AREA

ARITHMETIC STATEMENT FUNCTIONS

L41FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1392.2

DATE WRITTEN: 01/28/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'IDIGIT'

PURPOSE

CHECK FOR DIGITS IN A FIELD WITHIN A WORD

FUNCTIONAL CATEGORY: M5

USAGE

IDIGIT (I, ISTART, ISTOP)
IDIGIT (I, ISTART)
IDIGIT (I)

DESCRIPTION OF PARAMETERS

I - WORD TO BE ANALYZED
ISTART - STARTING POSITION OF FIELD TO BE CHECKED
(1-10, DEFAULT: 1)
ISTOP - STOP POSITION OF FIELD TO BE CHECKED
(1-10, DEFAULT: 10)
(TESTING WILL STOP IF 00B ENCOUNTERED)

REMARKS

THE VALUE RETURNED IS ONE OF THE FOLLOWING:
-11 - ERROR - ISTOP < ISTART
-N - ERROR - START NON-DIGIT FOUND IN POSITION N
0 - ALL POSITIONS IN FIELD ARE DIGITS
+N - 00B FOUND IN POSITION N
ALL PRECEDING CHARACTERS ARE DIGITS

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCF
MAX0
MIN0
SHIFT
OTHERS
NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 768

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 05/13/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'IFINDCH'
FUNCTION 'IFINDCH'

PURPOSE

FIND FIRST OCCURRENCE OF SPECIFIED CHARACTER IN ARRAY

FUNCTIONAL CATEGORY: M5

LANGUAGE: FORTRAN IV

USAGE

CALL IFINDCH (A, NA, CHAR, NC, NW)

NC = IFINDCH (A, NA, CHAR, NC, NW)

NC = IFINDCH (A, NA, CHAR)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SEARCHED

NA - NUMBER OF WORDS IN 'A' TO BE SEARCHED

CHAR - CHARACTER TO BE SEARCHED FOR (1R FORMAT)

NC - OUTPUT POSITION OF FIRST OCCURRENCE OF CHAR IN 'A'
(IF NO MATCH, ZERO (0) IS RETURNED)

NW - OUTPUT SUBSCRIPT OF WORD IN 'A' CONTAINING CHAR
(IF NO MATCH, NW IS SET TO NA)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOC

OTHERS

GETCHA - GET CHARACTER FROM ARRAY

CM REQUIRED: 1008

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 04/20/76

DATE(S) REVISED

11/02/76 - CHANGE TO FUNCTION AND SUBROUTINE

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'IFMTV'

PURPOSE

FAST I-FORMAT DECODE OF VARIABLE LENGTH INPUT

FUNCTIONAL CATEGORY: I4

USAGE

IFMTV (I)

DESCRIPTION OF PARAMETER

I - SINGLE WORD CONTAINING NUMBER TO BE DECODED;
1-10 DIGITS, LEFT-JUSTIFIED, ZERO PADDED;
A NON-DIGIT EMBEDDED IN THE FIELD WILL RETURN -1
(EG, 3L987 WILL RETURN THE INTEGER 987;
6L9 7654 WILL RETURN -1 (EMBEDDED BLANK))

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 618

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 10/74

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED CSYSNSROCPL; P.F. NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'IHMS'

PURPOSE

CONVERT SECONDS TO ' HH.MM.SS. '

FUNCTIONAL CATEGORY: M2

USAGE

IHMS (ISEC)

DESCRIPTION OF PARAMETER

ISEC - TIME (IN SECONDS) TO BE CONVERTED

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

OR SHIFT

OTHERS

NONE

CM REQUIRED: 44B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 05/08/74

DATE(S) REVISED

FUNCTION 'IPAKLFT'

PURPOSE

SQUEEZE LEFT AND REMOVE ZEROS (00B) AND BLANKS (55B), RETURN
NUMBER OF CHARACTERS

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

IF ANY BLANKS OR ZEROS WERE REMOVED, THE ARRAY IS PADDED
WITH TRAILING ZEROS

USAGE

NCHAR = IPAKLFT (A)
NCHAR = IPAKLFT (A, NA)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE PROCESSED
NA - NUMBER OF WORDS TO BE PROCESSED
(OMITTED = 1)
IPAKLFT - NUMBER OF NON-BLANK (NON-ZERO) CHARACTERS AFTER
PROCESSING

CM REQUIRED: 107B

EXAMPLE

DIMENSION A(3)
DATA A/ "THIS IS A SAMPLE FIELD"/
NCHAR = IPAKLFT (A, 3)
...
AFTER EXECUTION: 'A' = 18LTHISISASAMPLEFIELD, IPAKLFT = 18

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE
LOCF
OTHERS
GETCHA - GET A CHARACTER
PUTCHA - PUT A CHARACTER

AUTHOR

DAVID V SOMMER - DTNSROC CODE 1892.2

DATE WRITTEN: 07/25/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

FUNCTION 'IROMAN'

PURPOSE

CONVERT ROMAN NUMBERS TO INTEGER

FUNCTIONAL CATEGORY: M2

LANGUAGE: FORTRAN IV

REMARKS

VALIDITY OF THE ROMAN NUMBER IS NOT CHECKED. INVALID ROMAN
NUMERALS ARE IGNORED. ROMAN NUMBER ENDS WHEN FIRST
BLANK OR 00B IS ENCOUNTERED.

USAGE

IVAR = IROMAN (NUMBER)

DESCRIPTION OF PARAMETERS

IROMAN - WILL CONTAIN INTEGER EQUIVALENT OF SUPPLIED
ROMAN NUMBER

NUMBER - ROMAN NUMBER TO BE CONVERTED

GM REQUIRED: 1318

EXAMPLES

MCMLXXVI WILL RETURN THE INTEGER 1976
I " " " " 1
ETC.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE

NONE

OTHERS

GETCHA - EXTRACT CHARACTER FROM AN ARRAY

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 12/02/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'ISEC'

PURPOSE

CONVERT HH.MM.SS TO SECONDS

FUNCTIONAL CATEGORY: M2

USAGE

ISEC (ITIME)

DESCRIPTION OF PARAMETER

ITIME - TIME TO BE CONVERTED

(MAY BE 'HH.MM.SS.', ' HH.MM.SS.', OR ' HH.MM.SS')

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

AND SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

FAST I-FORMAT DECODE

I21FMT I24FMT I27FMT

FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

L11FMT

CM REQUIRED: 408

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 05/01/74

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'ISITCNF'

PURPOSE

SEE IF SPECIFIED FILE IS CONNECTED

FUNCTIONAL CATEGORY: Q0

USAGE

ISITCNF (I)

DESCRIPTION OF PARAMETER

I - FILE TO BE CHECKED (EG, 5LTAPE1)

REMARKS

THE FILE BEING TESTED MUST BE OPENED BEFORE USING THIS FUNCTION. FOR FORTRAN LFN'S, THIS IS ACCOMPLISHED BY ANY I/O OPERATION OR CALL CONNED OR CALL DISCON.

THE VALUE RETURNED WILL BE ONE OF:

- +1 - FILE IS CONNECTED
- 0 - FILE IS NOT CONNECTED
- 1 - ERROR - FILE NOT FOUND
- 2 - ERROR - I = 0

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

MFETCH - GET SPECIFIED WORD IN USER'S FIELD LENGTH

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

METHOD

BIT 44 OF WORD 10 (11TH WORD) OF FIT IS EXTRACTED.

CM REQUIRED: 54B

AUTHOR

DAVID V SOMMER - NSRDC CODE 1392.2

DATE WRITTEN: 05/02/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'ISTAPE'

PURPOSE

GENERATE TAPE NAME 'TAPENN'

FUNCTIONAL CATEGORY: M4

USAGE

NAME = ISTAPE (NN)

DESCRIPTION OF PARAMETERS

NAME - RESULTANT DISPLAY CODE NAME 'TAPENN'
(LEFT-JUSTIFIED, ZERO-FILLED)
(5LTAPEN OR 6LTAPENN)

NN - FORTRAN LOGICAL UNIT NUMBER

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 CP COMPASS

CM REQUIRED: 239

AUTHOR

NWL

DATE WRITTEN: ?

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

AD-A045 835 DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CE--ETC F/G 9/2
COMPUTER CENTER LIBRARIES/NSRDC (SUBPROGRAMS), (U)
SEP 77 D V SOMMER

DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CE--ETC F/G 9/2
COMPUTER CENTER LIBRARIES/NSRDC (SUBPROGRAMS), (U)
SEP 77 D V SOMMER

CMLD-77-15

NL

2 of 2
ADA045835

2 of 2

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END
DATE
FILMED
11-77
DDC

FUNCTION 'ISUMIT'

PURPOSE

SUM ELEMENTS OF INTEGER ARRAY

FUNCTIONAL CATEGORY: A1

LANGUAGE: FORTRAN IV

REMARKS

NONE

USAGE

ITOTAL = ISUMIT (IARRAY, N)

DESCRIPTION OF PARAMETERS

ISUMIT - WILL CONTAIN IARRAY(1)+IARRAY(2)+...+IARRAY(N)

IARRAY - ARRAY TO BE SUMMED

N - NUMBER OF ELEMENTS OF IARRAY TO BE SUMMED

CM REQUIRED: 16B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 11/23/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'JGDATE'

PURPOSE

CONVERT ANY GREGORIAN DATE TO A JULIAN DATE AND VICE VERSA
(MULTI-YEAR)

FUNCTIONAL CATEGORY: M2

USAGE

CALL JGDATE (JG, JD, IGY, IGM, IGD)

DESCRIPTION OF PARAMETERS

JG - DIRECTION OF CONVERSION

1 - GREGORIAN TO JULIAN

2 - JULIAN TO GREGORIAN

JD - JULIAN DATE

(OUT IF JG=1, IN IF JG=2)

IGY - GREGORIAN YEAR (EG, 1975)

(IN IF JG=1, OUT IF JG=2)

IGM - GREGORIAN MONTH (1-12)

(IN IF JG=1, OUT IF JG=2)

IGD - GREGORIAN DAY (1-31)

(IN IF JG=1, OUT IF JG=2)

REMARKS

JG=1 IS VALID FOR ANY GREGORIAN DATE PRODUCING A JULIAN
DATE GREATER THAN ZERO.

THIS SUBROUTINE IS USEFUL IN DETERMINING THE ELAPSED NUMBER
OF DAYS BETWEEN ANY TWO CALENDAR DATES. IT CAN ALSO BE USED
TO FIND THE CALENDAR DATE SO MANY DAYS FROM ANY GIVEN DATE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

METHOD

SEE COMM. OF THE ACM, VOL. 11, NO. 10, OCT 1968, PAGE 657.

CM REQUIRED: 71B

AUTHOR

?

DATE WRITTEN: ?

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'JOBNAME'
FUNCTION 'JOBNAME'

PURPOSE
GET SCOPE JOB NAME FOR THIS JOB

FUNCTIONAL CATEGORY: Q0

USAGE
CALL JOBNAME (I)
VARIABLE = JOBNAME (I)

DESCRIPTION OF PARAMETERS
JOBNAME - WILL CONTAIN JOB NAME, LEFT-JUSTIFIED,
ZERO-FILLED (WHEN USED AS FUNCTION)
I - WILL CONTAIN JOB NAME, LEFT-JUSTIFIED,
ZERO-FILLED

REMARKS
NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE
NONE
OTHERS
RCPA - READ CONTROL POINT AREA

ARITHMETIC STATEMENT FUNCTIONS
NONE

LANGUAGE: FORTRAN IV

METHOD
THE JOB NAME IS TAKEN FROM THE FIRST 7 CHARACTERS OF
CONTROL POINT AREA + 258

CM REQUIRED: 258

AUTHOR
DAVID V SOMMER - DTNSROC CODE 1892.2

DATE WRITTEN: 12/04/75

DATE(S) REVISED

LOCATION OF DECKS
SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSROC

FUNCTION 'JOBORG'
SUBROUTINE 'JOBORG'

PURPOSE
DETERMINE JOB ORIGIN

FUNCTIONAL CATEGORY: Q0

LANGUAGE: FORTRAN IV EXTENDED

REMARKS
NONE

USAGE
IVAR = JOBORG (I, IA)
IVAR = JOBORG (I)
CALL JOBORG (I, IA)
CALL JOBORG (I)

DESCRIPTION OF PARAMETERS
I - WILL CONTAIN ONE OF THE FOLLOWING:
1 - IF CALLING JOB IS A BATCH JOB
2 - FOR REAL TIME JOB
3 - FOR GRAPHICS JOB
4 - FOR MULTI-USER JOB
5 - FOR INTERCOM
IA - IF SPECIFIED, WILL CONTAIN: 'BATCH', 'REAL TIME',
'GRAPHICS', 'MULTI-USER', OR 'INTERCOM', ACCORDING
TO THE VALUE OF 'I'.

IF USED AS A FUNCTION, 'JOBORG' WILL RETURN THE SAME VALUE
AS 'I'.

CM REQUIRED: 35B

METHOD
THE INFORMATION IS TAKEN FROM THE CONTROL POINT AREA.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE
AND
OTHERS
RCPA - READ CONTROL POINT AREA

AUTHOR
DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 03/07/77

DATE(S) REVISED

LOCATION OF DECKS
SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'JULIAN'

PURPOSE

CONVERT ANY GREGORIAN DATE TO A JULIAN DATE AND VICE VERSA
(SINGLE YEAR)

FUNCTIONAL CATEGORY: M2

USAGE

CALL JULIAN (JG, JD, IGY, IGM, IGD)

DESCRIPTION OF PARAMETERS

JG - DIRECTION OF CONVERSION
1 - GREGORIAN TO JULIAN
2 - JULIAN TO GREGORIAN
JD - JULIAN DAY-OF-YEAR (1-366)
IGY - GREGORIAN YEAR (EG, 1968)
IGM - GREGORIAN MONTH (1-12)
IGD - GREGORIAN DAY (1-31)

REMARKS

THE PARAMETER 'IGY' IS ALWAYS INPUT.

IF JG=1 AND (GM<1 OR GM>12 OR GD<1 OR GD>31),
THEN JD IS SET TO ZERO (0).

IF JG=2 AND (JD<1 OR JD>366), THEN GM IS SET TO ZERO (0).

IF JG IS NOT 1 OR 2, THEN JD AND GM ARE SET TO ZERO (0).

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

MOD

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 1638

AUTHOR

DAVID V SOMMER - NSROC CODE 1892.2

DATE WRITTEN: 1968

DATE(S) REVISED

04/26/73 - REWRITTEN IN FORTRAN FOR CDC 6000 - DVS
06/21/76

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'KUTMER'

PURPOSE

INTEGRATE A SYSTEM OF FIRST-ORDER ORDINARY DIFFERENTIAL EQUATIONS USING THE KUTTA-MERSON FOURTH-ORDER, SINGLE-STEP METHOD

FUNCTIONAL CATEGORY: 02

USAGE

CALL KUTMER (N, T, Y, EPS, H, FIRST, HCN, A)

DESCRIPTION OF PARAMETERS

- N - NUMBER OF EQUATIONS (I.E., THE NUMBER OF COMPONENTS IN Y-BAR)
- T - THE INDEPENDENT VARIABLE, T
- Y - THE ARRAY OF DEPENDENT VARIABLES, Y-BAR
- EPS - THE RELATIVE ERROR CRITERION FOR EACH STEP, TO BE USED FOR THOSE COMPONENTS OF Y-BAR WHICH ARE GREATER THAN A IN ABSOLUTE VALUE
- H - THE INTEGRATION INTERVAL, H
- FIRST - WILL HAVE ONE OF THE FOLLOWING SETTINGS:
 - 0 - WHEN KUTMER IS ENTERED FOR THE FIRST TIME, OR IS RE-ENTERED WITH A CHANGED INTERVAL <H>. WHEN KUTMER IS SO ENTERED, <FIRST> IS RESET BY KUTMER TO 1.
 - 1 - WHEN KUTMER IS RE-ENTERED WITH THE SAME INTERVAL <H>, TO CONTINUE AN INTEGRATION SEQUENCE. UNDER THESE CIRCUMSTANCES, KUTMER WILL NOT RESET <FIRST>.
 - 2 - WHEN KUTMER CANNOT MEET THE SPECIFIED ERROR CRITERIA EVEN WHEN THE INTEGRATION STEP HAS BEEN REDUCED TO H/128. KUTMER WILL RESET <FIRST> TO 2 AND PRINT A STATEMENT INDICATING THAT THE ERROR CRITERION COULD NOT BE MET. THEN KUTMER WILL RETURN CONTROL TO THE CALLING PROGRAM.
- HCN - IS SET UP BY KUTMER BEFORE EACH RETURN TO THE CALLING PROGRAM. THIS WILL CONTAIN THE MINIMUM STEP SIZE USED DURING THE INTEGRATION OVER THE INTERVAL <H>.
- A - AN ABSOLUTE ERROR CRITERION TO BE USED FOR ANY COMPONENT OF Y-BAR WHENEVER IT BECOMES SMALLER IN ABSOLUTE VALUE THAN <A>.

ON ENTRY, <T> AND THE ARRAY <Y> CONTAIN VALUES OF THE INDEPENDENT AND THE DEPENDENT VARIABLES, RESPECTIVELY, AT THE BEGINNING OF THE INTERVAL OF INTEGRATION. ON RETURN, PROVIDED THE ERROR CRITERION HAS BEEN MET, I.E., <FIRST> HAS NOT BEEN RESET TO 2, <T> AND <Y> CONTAIN VALUES OF T AND Y-BAR AT THE END VALUES OF THE INTEGRATION INTERVAL OF <H>.

A SUBROUTINE FOR EVALUATING F-BAR(T, Y-BAR) WITH A CALL OF THE FORM

CALL DAUX (T, Y, F)

MUST BE SUPPLIED. HERE <T> AND THE ARRAY <Y> REFER TO T AND Y-BAR, RESPECTIVELY, AND THE ARRAY <F> SHOULD CONTAIN, ON RETURN FROM THIS SUBROUTINE, THE VECTOR F-BAR (T, Y-BAR).

REMARKS

THIS ROUTINE WILL INTEGRATE A SYSTEM OF FIRST-ORDER DIFFERENTIAL EQUATIONS OF THE FORM

$$\frac{d\bar{Y}}{dt} = \bar{F}(t, \bar{Y})$$

GIVEN A SET OF INITIAL CONDITIONS $T_0, \bar{Y}(T_0)$,
AN INTERVAL H AND A SUBROUTINE FOR EVALUATING $\bar{F}(T, \bar{Y})$
FOR SPECIFIED VALUES OF T AND Y-BAR.

THE DIMENSIONS OF THE ARRAYS FOR STORING INTERMEDIATE VALUES OF THE VECTORS F-BAR AND Y-BAR ARE PRESENTLY SET TO 10. THIS CAN BE READILY CHANGED BY CHANGING THE DIMENSION STATEMENT AT THE BEGINNING OF THE SUBROUTINE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED PART OF LANGUAGE

ABS
OTHERS
DAUX - USER-SUPPLIED SUBROUTINE TO EVALUATE F-BAR

LANGUAGE: FORTRAN IV

METHOD

THE KUTTA-MERSON METHOD OF INTEGRATING A SYSTEM OF FIRST-ORDER ORDINARY DIFFERENTIAL EQUATIONS IS USED. THIS IS A FOURTH-ORDER, SINGLE-STEP METHOD WHICH PROVIDES A CONVENIENT TECHNIQUE FOR AUTOMATIC INTERVAL ADJUSTMENT (C.F., E. FOX, "NUMERICAL SOLUTION OF ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS", ADDISON-WESLEY, READING, MASS., 1962, P. 24). THE ROUTINE IS BASICALLY A TRANSLATION INTO FORTRAN OF ALGOL ALGORITHM 218 PUBLISHED IN "COMMUNICATIONS OF THE ACM", DEC. 1963.

OUTPUT UNITS

UNIT--#	--LEN--	-----USE-----
OUTPUT	ERROR MESSAGE	

CN REQUIRED: 3358

AUTHOR

E. CUTHILL - DTNSRDC CODE 1805

DATE WRITTEN: 10/29/64 (FORTRAN VERSION)

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
TAPE LABELLED: CLIBRARYUPD3,0=HY
OBJECT
EDITLIB USER LIBRARY: NSRDC

FUNCTION 'LASTC'

PURPOSE

DETERMINE NUMBER OF CHARACTERS THRU LAST NON-BLANK
(NON-ZERO (008))

FUNCTIONAL CATEGORY: M5

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

THE WORD IN 'A' WHICH CONTAINS THE LAST NON-BLANK (NON-
ZERO) CHARACTER IS (LASTC(A,N)+9)/10

USAGE

LASTC (A)
LASTC (A, N)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SCANNED
N - NUMBER OF WORDS IN 'A' TO BE PROCESSED
LASTC - WILL CONTAIN THE NUMBER OF CHARACTERS IN 'A'
EXCLUDING TRAILING BLANKS (ZEROS)

CM REQUIRED: 64B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE
LOCF SHIFT
OTHERS
NONE

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 01/06/76

DATE(S) REVISED

07/25/77 - MAKE PARAMETER 'N' OPTIONAL

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

FUNCTION 'LASTWRD'

PURPOSE

DETERMINE SUBSCRIPT OF LAST WORD OF ARRAY WHICH
CONTAINS A NON-BLANK

FUNCTIONAL CATEGORY: M5

USAGE

LASTWRD (A, N)

DESCRIPTION OF PARAMETERS

LASTWRD - WILL CONTAIN SUBSCRIPT OF LAST WORD OF ARRAY WHICH
CONTAINS A NON-BLANK (AND NON-00B)

A - ARRAY TO BE SCANNED

N - NUMBER OF WORDS IN 'A' TO BE PROCESSED

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

LASTC - FIND LAST NON-BLANK/NON-00B CHARACTER IN ARRAY

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

GM REQUIRED: 22B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1832.2

DATA WRITTEN: 03/15/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'LBYT'

PURPOSE

EXTRACT VARIABLE LENGTH BYTE

FUNCTIONAL CATEGORY: M4

USAGE

VARIABLE = LBYT (N, LENGTH, FROM)

DESCRIPTION OF PARAMETERS

VARIABLE - LOCATION INTO WHICH THE EXTRACTED BYTE IS
STORED RIGHT-JUSTIFIED
N - STARTING BIT POSITION OF THE BYTE TO BE
EXTRACTED. BITS ARE NUMBERED 1-60 FROM RIGHT
TO LEFT.
LENGTH - LENGTH OF THE BYTE (NUMBER OF BITS)
FROM - WORD FROM WHICH THE BYTE IS TO BE EXTRACTED

REMARKS

EXTRACTS A BYTE OF ANY LENGTH (1-60 BITS) FROM A 60-BIT
WORD. THE EXTRACTED BYTE IS THEN STORED RIGHT-JUSTIFIED
INTO ANOTHER 60-BIT WORD.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

NONE

EXAMPLE

STARTING AT THE TWELFTH BIT FROM THE RIGHT OF A WORD, A
FOUR-BIT BYTE WILL BE EXTRACTED FROM THE VARIABLE <TAKE> AND
STORED IN VARIABLE <ISTORE> IN BIT PLACES 1-4.

TAKE = 1111 2222 3333 4476 5555B
ISTORE = LBYT (12, 4, TAKE)

RESULTS IN

ISTORE = 0000 0000 0000 0000 0016B

NOTE: BIT POSITIONS 12-15 OF <TAKE> ARE 1 1 1 0.

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 16B

AUTHOR

FROM CDC KRONOS SYSTEM

DATE WRITTEN:

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSROCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'LEFTADJ'

PURPOSE

SQUEEZE LEFT AND REMOVE BLANKS AND 008 (USER MAY SUPPLY TRAILING FILL CHARACTER)

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

THE LAST NON-BLANK CHARACTER POSITION AND WORD ARE RETURNED.

USAGE

CALL LEFTADJ (A, NA, LASTC, NW, FILL)

CALL LEFTADJ (A, NA, LASTC, NW)

DESCRIPTION OF PARAMETERS

- A - ARRAY TO BE LEFT JUSTIFIED
- NA - NUMBER OF WORDS IN 'A' TO BE PROCESSED
- LASTC - WILL RETURN THE LAST CHARACTER POSITION WHICH IS NON-BLANK/NON-008 (LEFT-MOST CHARACTER POSITION IS 1)
(IF ARRAY CONTAINS ONLY BLANKS AND/OR 008, LASTC IS SET TO 0)
- NW - WILL RETURN SUBSCRIPT OF WORD CONTAINING LAST NON-BLANK/NON-008 CHARACTER
(IF LASTC=0, THEN NW IS SET TO 0)
- FILL - OPTIONAL FILL CHARACTER FOR EACH CHARACTER POSITION AFTER LASTC (USE 1R OR 1H FORMAT)
(IF OMITTED, FILL CHARACTER IS 008)

CM REQUIRED: 1178

EXAMPLE

```
DIMENSION A(4)
CONTENTS OF A: 12345      67890      ABCDEFGHIJ
CALL LEFTADJ (A, 4, LASTC, NW)
CONTENTS OF A: 1234567890ABCDEFGHIJ
LASTC IS 20; NW = 2
CALL LEFTADJ (A, 4, LASTC, NW, 1R/)
CONTENTS OF A: 1234567890ABCDEFGHIJ////////////////////
LASTC AND NW ARE THE SAME
```

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF

OTHERS

GETCHA - EXTRACT ONE CHARACTER FROM AN ARRAY

PUTCHA - INSERT ONE CHARACTER INTO AN ARRAY

ARITHMETIC STATEMENT FUNCTIONS

R11FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 11/02/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'LINE6'

PURPOSE

SET PRINT FILE TO 6 LINES PER INCH

FUNCTIONAL CATEGORY: J4

USAGE

CALL LINE6 (IOUT)

DESCRIPTION OF PARAMETER

IOUT - OUTPUT UNIT NUMBER (1-99) OR NAME (1-7 CHARACTERS,
LEFT-JUSTIFIED, ZERO-FILLED)

REMARKS

USER SHOULD PRINT HIS NEXT LINE AT THE TOP OF THE NEXT PAGE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

OUTPUT UNIT

UNIT #	LFN	USE
--------	-----	-----

IOUT		LISTABLE OUTPUT FILE
------	--	----------------------

CM REQUIRED: 208

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 06/11/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'LINE8'

PURPOSE

SET PRINT FILE TO 8 LINES PER INCH

FUNCTIONAL CATEGORY: J4

USAGE

CALL LINE8 (IOUT)

DESCRIPTION OF PARAMETER

IOUT - OUTPUT UNIT NUMBER (1-99) OR NAME (1-7 CHARACTERS,
LEFT-JUSTIFIED, ZERO-FILLED)

REMARKS

USER SHOULD PRINT HIS NEXT LINE AT THE TOP OF THE NEXT PAGE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

OUTPUT UNIT

UNIT #	LEN	USE
IOUT		LISTABLE OUTPUT FILE

CM REQUIRED: 208

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 06/11/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'MASKIT'

PURPOSE

DYNAMIC MASK GENERATOR

FUNCTIONAL CATEGORY: MD

USAGE

MSK = MASKIT (FL1, BIT1, FL2, BIT2, ..., FLN, BITN)

DESCRIPTION OF PARAMETERS

FL - NUMBER OF BITS

BIT - STARTING BIT ADDRESS

BIT ADDRESSES ARE THE RELEVANT POWER OF 2.

I.E., 59,58,57,... ...,2,1,0

REMARKS

MASKIT GENERATES AS ITS FUNCTIONAL VALUE A WORD WITH 'N' FIELDS OF BITS SET, EACH FIELD 'FL' BITS LONG, AND STARTING AT BIT ADDRESS 'BIT'.

EXAMPLE: TO GENERATE THE MASK

111000111111111101110000000001000100000001111110000000111111
7 0 7 7 7 6 7 0 0 0 4 2 0 0 7 7 0 0 7 7

USE THE FOLLOWING:

MSK = MASKIT (3,59, 11,53, 3,41, 1,29, 1,25, 6,17, 6,5)

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 16B

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 07/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'MATINS'

PURPOSE

MATRIX INVERSION WITH ACCOMPANYING SOLUTION OF SIMULTANEOUS
EQUATIONS AND DETERMINANT

FUNCTIONAL CATEGORIES: F4 F1 F3

LANGUAGE: FORTRAN IV

REMARKS

TESTS FOR LOSS OF DIGITS DUE TO SUBTRACTION.

TO SCALE THE DETERMINANT, ROUTINE MUST BE RECOMPILED TO OMIT
INTERNAL 'DETERM = 1.'. IN THIS CASE, PARAMETER 'DETERM' IS
THE INPUT SCALING FACTOR AS WELL AS THE OUTPUT DETERMINANT.

USAGE

CALL MATINS (A, NR, N1, B, NC, M1, DETERM, ID, INDEX)

DESCRIPTION OF PARAMETERS

A - INPUT MATRIX (NR X NR)
(WILL BE REPLACED BY INVERSE OF 'A')
NR - REFERS TO CALLING PROGRAM DIMENSIONS:
ROWS IN 'A'; # COLUMNS IN 'A';
ROWS IN 'B'; # ROWS IN 'INDEX'
N1 - ORDER OF 'A'
(ACTUAL SIZE OF 'A' BEING USED)
3 - COLUMN VECTORS
(WILL BE REPLACED BY CORRESPONDING SOLUTION
VECTORS)
NC - REFERS TO CALLING PROGRAM DIMENSIONS:
COLUMNS IN 'B'
M1 - NUMBER OF ACTUAL COLUMN VECTORS IN 'B'
(MAY BE 0)
DETERM - OUTPUT DETERMINANT
ID - OUTPUT CODE
1 - INVERSE SUCCESSFUL
2 - MATRIX 'A' SINGULAR
INDEX - WORKING STORAGE ARRAY OF DIMENSION (NR X 3)

NOTE: N1 <= NR; M1 <= NC

CH REQUIRED: 3568

METHOD

PIVOT METHOD - GAUSS-JORDAN

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

ABS

OTHERS

NONE

AUTHOR

ANF402 FROM SHARE

SHARON E GOOD - DTNSROC CODE 1892.1

C R NEWMAN - NOL

DATE WRITTEN: 11/71

DATE(S) REVISED

07/26/77 - ADD CRN CODING (SEG)

LOCATION OF DECKS

SOURCE

TAPE LABELLED: CLIBRARYUPD3

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'MAXE'
FUNCTION 'MAXE'
FUNCTION 'AMAXE'

PURPOSE

FIND MAXIMUM VALUE OF AN ARRAY

FUNCTIONAL CATEGORY: M5

USAGE

CALL MAXE (ARRAY, ISIZE, AMAXV)

MAXV = MAXE (IARRAY, ISIZE)
AMAXV = AMAXE (ARRAY, ISIZE)

DESCRIPTION OF PARAMETERS

ARRAY - REAL ARRAY TO BE PROCESSED
IARRAY - INTEGER ARRAY TO BE PROCESSED
ISIZE - LENGTH OF ARRAY/IARRAY
AMAXV - REAL MAXIMUM RETURNED IN SUBROUTINE

REMARKS

FUNCTION MAXE HAS INTEGER INPUT AND OUTPUT.
FUNCTION AMAXE HAS REAL INPUT AND OUTPUT.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE
NONE
OTHERS
NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 148

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 11/22/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL,ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

FUNCTION 'MFETCH'

PURPOSE

FETCH A SINGLE WORD (BY ABSOLUTE ADDRESS) FROM USER'S FL

FUNCTIONAL CATEGORY: K2

USAGE

MFETCH (ADDR)

DESCRIPTION OF PARAMETER

ADDR - ADDRESS IN USER'S FL TO BE FETCHED

REMARKS

'MFETCH' IS AN ENTRY POINT IN 'CMORCT'.

NO ERROR CHECKING IS DONE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 11B (INCLUDES 'MSET')

AUTHOR

? - NWL

DATE WRITTEN:

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USSER LIBRARY: NSRDC

SUBROUTINE 'MFX'
FUNCTION 'MFX'

PURPOSE

OBTAIN THE MAINFRAME THE PROGRAM IS RUNNING ON

JSAGE

CALL MFX (ICPU)
VARIABLE = MFX (ICPU)

DESCRIPTION OF PARAMETER

ICPU - WILL RETURN MACHINE ON WHICH THE PROGRAM IS RUNNING
(LEFT-ADJ, ZERO-FILLED)
(WILL RETURN ONE OF 4L6700, 4L6600, 4L6400)
MF - WILL RETURN MAINFRAME ON WHICH MACHINE IS RUNNING
(LEFT-ADJ, ZERO-FILLED)
(WILL RETURN ONE OF 3LMFA, 3LMFB, 3LMFC)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE
AND MACHINE OP SHIFT
OTHERS
NONE

ARITHMETIC STATEMENT FUNCTIONS

L38FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV EXTENDED

CM REQUIRED: 46B

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 04/18/75

DATE(S) REVISED

03/22/76 - MAKE FUNCTION AS WELL AS SUBROUTINE
08/24/77 - CHANGE NAME FROM CPU467 TO MFX
RETURN MFA/MBF/MFC AS THE FUNCTION VALUE

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL,IO=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'MINE'
FUNCTION 'MINE'
FUNCTION 'AMINE'

PURPOSE

FIND MINIMUM VALUE OF AN ARRAY

FUNCTIONAL CATEGORY: M5

USAGE

CALL MINE (ARRAY, ISIZE, AMINV)

MINV = MINE (IARRAY, ISIZE)

AMINV = AMINE (ARRAY, ISIZE)

DESCRIPTION OF PARAMETERS

ARRAY - REAL ARRAY TO BE PROCESSED

IARRAY - INTEGER ARRAY TO BE PROCESSED

ISIZE - LENGTH OF ARRAY/IARRAY

AMINV - REAL MINIMUM RETURNED IN SUBROUTINE

REMARKS

FUNCTION MINE HAS INTEGER INPUT AND OUTPUT.

FUNCTION AMINE HAS REAL INPUT AND OUTPUT.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 148

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 11/22/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'MONTH'

PURPOSE

FROM A DATE (MM/DD/YY) FIND THE MONTH AND RETURN FULL
SPELLING AND 3- OR 4-CHARACTER ABBREVIATION

FUNCTIONAL CATEGORY: M2

USAGE

CALL MONTH (DATE, MONTH, MM)

DESCRIPTION OF PARAMETERS

DATE - DATE TO BE PROCESSED ('MM/DD/YY ', ' MM/DD/YY '
OR ' MM/DD/YY')
IMONTH - WILL CONTAIN THE MONTH (COMPLETE SPELLING)
MM - WILL CONTAIN THE MONTH (3- OR 4-CHARACTER
ABBREVIATION)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

I21FMT - FAST I-FORMAT DECODE

L11FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

CM REQUIRED: 63B

AUTHOR

DAVID V SMOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 07/21/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'MOVSTR'

PURPOSE

MOVE A STRING OF CHARACTERS FROM ONE ARRAY TO ANOTHER

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

CALL MOVSTR (FROM, IFROM, TO, ITO, LEN, IRC)

CALL MOVSTR (FROM, IFROM, TO, ITO, LEN)

DESCRIPTION OF PARAMETERS

FROM - ARRAY FROM WHICH STRING IS TO BE EXTRACTED
IFROM - STARTING POSITION OF STRING TO BE EXTRACTED
(POSITION 1 IS LEFT-MOST CHARACTER OF FROM(1))
TO - ARRAY TO RECEIVE THE STRING
ITO - STARTING POSITION TO INSERT THE STRING
(POSITION 1 IS LEFT-MOST CHARACTER ON TO(1))
LEN - NUMBER OF CHARACTERS IN STRING TO BE MOVED
IRC - OPTIONAL ERROR RETURN CODE
0 - NO ERROR, STRING MOVED
1 - IFROM LE 0
2 - ITO LE 0
3 - LEN LE 0

CM REQUIRED: 718

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

AND LOGF MOD OR SHIFT

OTHERS

NONE

EXAMPLE

FROM: ABCDEFGHIJKLMNOPQRSTUVWXYZ TO: *****
AFTER CALL MOVSTR (FROM, 5, TO, 12, 4, IRC)
FROM: ABCDEFGHIJKLMNOPQRSTUVWXYZ TO: *****EFG4*****
IRC : 0

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 10/04/76

DATE(S) REVISED

04/04/77 - MAKE IRC OPTIONAL

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'MSET'

PURPOSE

SET A SINGLE WORD (BY ABSOLUTE ADDRESS) IN USER'S FL

FUNCTIONAL CATEGORY: K2

USAGE

CALL MSET (ADDR, NEW)

DESCRIPTION OF PARAMETERS

ADDR - ADDRESS IN USER'S FL TO BE SET

NEW - WORD TO BE PUT INTO 'ADDR'

REMARKS

'MSET' IS AN ENTRY POINT IN 'CMDRCT'.

NO ERROR CHECKING IS DONE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 11B (INCLUDES 'MFETCH')

AUTHOR

? - NWL:

DATE WRITTEN:

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'NEWDAT'

PURPOSE

ADD/SUBTRACT SPECIFIED NUMBER OF DAYS TO/FROM A GIVEN DATE

FUNCTIONAL CATEGORY: M2

USAGE

CALL NEWDAT (FMT, OLD, NEW, OCENT, NCENT, ADD)

DESCRIPTION OF PARAMETERS

FMT - FORMAT OF DATE (INTEGER)

1 - 'MM/DD/YY '

2 - 'MM/DD/YY '

OLD - OLD DATE (MM/DD/YY)

NEW - NEW DATE

OCENT - OLD CENTURY (E.G., INTEGER 1900)

NCENT - NEW CENTURY (E.G., INTEGER 1900)

ADD - NUMBER OF DAYS TO ADD
(NEGATIVE TO SUBTRACT)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

JGDATE - JULIAN/GREGORIAN DATE CONVERTER (MULTI-YEAR)

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 156B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 1968

DATE(S) REVISED

02/73 - CONVERT TO SCOPE 3.3

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'NFILL'

PURPOSE

FILL ELEMENTS 1 THRU N OF AN ARRAY WITH THE VALUES 1 THRU N,
RESPECTIVELY

FUNCTIONAL CATEGORY: A1

USAGE

CALL NFILL (A, N)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE FILLED

N - NUMBER OF ELEMENTS TO BE FILLED

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 CP COMPASS

CM REQUIRED: 6B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 08/09/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'NFILLT'
SUBROUTINE 'NFILLT'

PURPOSE

TEST AN ARRAY FOR THE PRESENCE OF THE INTEGERS 1 THRU N
IN ELEMENTS 1 THRU N, RESPECTIVELY

FUNCTIONAL CATEGORY: M5

USAGE

ISUB = NFILLT (A, N, I)
CALL NFILLT (A, N, I)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SCANNED
N - NUMBER OF ELEMENTS TO TEST
I - =0 - A(1) THRU A(N) CONTAIN 1 THRU N
 >0 - A(I) IS FIRST ELEMENT TO FAIL TEST
NFILLT - IF USED AS A FUNCTION, WILL RETURN THE SAME VALUE
 AS 'I'

REMARKS

A SUGGESTED USE OF THIS ROUTINE IS IN CONJUNCTION WITH ONE
OF THE SORTING ROUTINES TO DETERMINE IF THE ARRAY BEING
SORTED WAS ALREADY IN ORDER.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE

NONE
OTHERS
NONE

ARITHMETIC STATEMENT FUNCTIONS
NONE

LANGUAGE: FORTRAN IV EXTENDED

CM REQUIRED: 40B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 08/19/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
 UPDATE LIBRARY: NSRDCPL,IO=CSYS
OBJECT
 EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'NUMEXEC'

PURPOSE

GET NUMBER OF EXECUTE CARD PARAMETERS WHICH WERE USED IN
THIS EXECUTION OF THE PROGRAM

FUNCTIONAL CATEGORY: Q0

USAGE

CALL NUMEXEC (NEXEC)

DESCRIPTION OF PARAMETER

NEXEC - WILL RETURN THE NUMBER OF EXECUTE CARD PARAMETERS

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

MFETCH - GET SPECIFIED WORD OF USER'S FL

ARITHMETIC STATEMENT FUNCTIONS

R38FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

METHOD

THE NUMBER OF PARAMETERS IS IN THE RIGHTMOST 18 BITS OF
WORD RA+52 (64B) IN THE USER'S FL.

CM REQUIRED: 16B

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 04/15/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED CSYSNSRDCPL; P.F. NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'OFMTDE'

PURPOSE

FAST O-FORMAT DECODE

FUNCTIONAL CATEGORY: I2

USAGE

VARIABLE = OFMTDE (IWORD, ISTART, NCHAR)

DESCRIPTION OF PARAMETERS

VARIABLE - WILL CONTAIN THE RESULT RIGHT-JUSTIFIED
OR -1 IF NON-OCTAL DIGIT FOUND
OR -2 IF ISTART IS OUT OF RANGE
OR -3 IF ISTART+NCHAR GREATER THAN 10.
(IF VARIABLE IS INTEGER, OFMTDE MUST BE DECLARED
INTEGER IN THE CALLING PROGRAM)

IWORD - WORD FROM WHICH THE FIELD WILL BE EXTRACTED

ISTART - FIRST CHARACTER POSITION OF FIELD WITHIN IWORD
(1-10)

NCHAR - NUMBER OF CHARATERS IN FIELD (1-10)
(ISTART+NCHAR MUST BE LESS THAN 11)

EXAMPLE

VARIABLE = OFMTDE (10L1234567654, 6, 3) WILL PRODUCE
VARIABLE = 0000 0000 0000 0000 0676B

VARIABLE = OFMTDE (5L123.4, 3, 3) WILL PRODUCE
VARIABLE = 7777 7777 7777 7777 7776B

VARIABLE = OFMTDE (IWORD, 0, 5) WILL PRODUCE
VARIABLE = 7777 7777 7777 7777 7775B

VARIABLE = OFMTDE (IWORD, 3, 9) WILL PRODUCE
VARIABLE = 7777 7777 7777 7777 7774B

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

LANGUAGE: FORTRAN IV

CM REQUIRED: 76B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 11/24/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

08/22/77

2-104

OFMTDE - 1 OF 1

FUNCTION 'OFMTV'

PURPOSE

FAST O-FORMAT DECODE OF VARIABLE LENGTH INPUT

FUNCTIONAL CATEGORY: I2

USAGE

VARIABLE = OFMTV (I)

DESCRIPTION OF PARAMETERS

VARIABLE - WILL CONTAIN THE RESULT RIGHT-JUSTIFIED
OR -1 IF A NON-OCTAL DIGIT FOUND.
IF VARIABLE IS INTEGER, OFMTV MUST BE
DECLARED INTEGER IN THE CALLING PROGRAM.
I - WORD OF OCTAL DIGITS ENDING WITH AN OCTAL
003. (EG, 3L123, 9L123456701)

EXAMPLE

VARIABLE = OFMTV (5L12345) WILL RETURN
VARIABLE = 0000 0000 0000 0001 2345B

VARIABLE = OFMTV (1L+) WILL RETURN
VARIABLE = 7777 7777 7777 7777 7776B

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 35B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 11/24/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'OVLNAME'

PURPOSE

GET NAME OF FILE CURRENTLY BEING EXECUTED

FUNCTIONAL CATEGORY: Q0

USAGE

CALL OVLNAME (I)

DESCRIPTION OF PARAMETER

I - WILL CONTAIN THE LOCAL FILE NAME CURRENTLY BEING
EXECUTED

REMARKS

'I' MAY BE USED AS THE FIRST ARGUMENT IN 'CALL OVERLAY'

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 COMPASS

METHOD

THE FILE NAME IS EXTRACTED FROM BITS 59-18 OF WORD
RA+643 IN THE USER'S FIELD LENGTH

CM REQUIRED: 3

AUTHOR

? - NWL

DATE WRITTEN: ?

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED CSYSNSRDCPL; P.F. NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'PARGET'

PURPOSE

GET ALL PARAMETERS OF USER-SUPPLIED PARAMETER STRING

FUNCTIONAL CATEGORY: M4

USAGE

CALL PARGET (IAREA, LAREA, IPARAM, NPARAM, ISEP, RSEP, LSEP)
CALL PARGET (IAREA, LAREA, IPARAM, NPARAM, ISEP, RSEP)
CALL PARGET (IAREA, LAREA, IPARAM, NPARAM, ISEP)
CALL PARGET (IAREA, LAREA, IPARAM, NPARAM)

DESCRIPTION OF PARAMETERS

IAREA - AREA CONTAINING PARAMETER LIST TO BE EXTRACTED

LAREA - NUMBER OF WORDS IN 'IAREA' (16 MAX)

IPARAM - ARRAY TO CONTAIN PARAMETERS

(IF IT IS NOT KNOWN WHETHER THE PARAMETER LIST IN IAREA CONTAINS A TERMINATOR ('.' OR ')') OR NOT, THEN IPARAM, ISEP, LSEP AND RSEP SHOULD BE DIMENSIONED AT LEAST 10 TIMES LAREA. THIS WILL ALLOW FOR THE WORST POSSIBLE CASE (IAREA ALL BLANKS).)

NPARAM - WILL BE NUMBER OF PARAMETERS FOUND

ISEP - IF PRESENT, ARRAY TO CONTAIN A CODE IDENTIFYING THE SEPARATOR FOUND FOLLOWING THE CORRESPONDING PARAMETER

DEC	OCT	SEPARATOR
1	1	,
2	2	=
3	3	/
4	4	(
5	5	+
6	6	-
7	7	BLANK
8	10B	;
14	16B	OTHER
15	17B	. OR) (TERMINATOR)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCF

OTHERS

EXTPRM - EXTRACT THE NEXT PARAMETER

ARITHMETIC STATEMENT FUNCTIONS

NONE

CM REQUIRED: 106B

AUTHOR

DAVID V SOMMER - CODE 1892.2

DATE WRITTEN: 04/11/74

DATE(S) REVISED

11/18/75 - NAME CHANGED FROM SETPAR TO PARGET TO AVOID
CONFLICT WITH SYSIO ROUTINE OF SAME NAME

06/24/76 - PROCESSING OF OPTIONAL PARAMETERS MODIFIED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'PFRG'

PURPOSE

SUPPLY DESCRIPTION OF PERMANENT FILE FUNCTION RETURN CODE

FUNCTIONAL CATEGORY: Q0

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

THE DESCRIPTIONS ARE THOSE FOUND IN THE SCOPE REFERENCE
MANUAL (60307200 G) ON PAGE 5-20.

USAGE

CALL PFRG (IRC, A)

DESCRIPTION OF PARAMETERS

IRC - RETURN CODE FROM THE PERMANENT FILE FUNCTION
A - 5-WORD ARRAY WHICH WILL CONTAIN THE DESCRIPTION OF THE
SUPPLIED 'IRC'
(IF 'IRC' IS INVALID, 'UNKNOWN RETURN CODE' IS
RETURNED)

CM REQUIRED: 722B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

MOVLEV

OTHERS

NONE

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 05/18/76

DATE(S) REVISED

02/14/77 - UPDATE FOR NOS/BE 1.0

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'PLOTPR'

PURPOSE

PRODUCE PRINTER PLOTS WHICH MAY HAVE:

- 1) ANY NUMBER OF PLOTS PER RUN
- 2) ANY NUMBER OF VALUES FOR THE INDEPENDENT VARIABLE
- 3) UP TO 9 DEPENDENT VARIABLES PER PLOT.

FUNCTIONAL CATEGORY: J5

USAGE

COMMON /PLO/ NRUN, NPLO, ITP(6), ITY(6), ITX(6),
NUMPAG, MAXSCA, SCA(10), FROM(10)

...
CALL INITPLO

C SET ANY SPECIAL VALUES IN COMMON /PLO/ AFTER 'CALL INITPLO'

...
C WRITE DATA FOR THE PLOT

DO 5 I=1,NOPTS

5 WRITE (NFILE) VARIND(I), VARDEP1(I), ..., VARDEPN(I)

...
CALL PLOTPR (NFILE, NUMVAR, IVAR)

DESCRIPTION OF PARAMETERS

NFILE - FORTRAN LOGICAL UNIT NUMBER OF FILE CONTAINING
THE DATA VALUES, INDEPENDENT FOLLOWED BY DEPENDENT

NUMVAR - NUMBER OF VARIABLES
(TOTAL: INDEPENDENT + DEPENDENT)

IVAR - 10-WORD ARRAY WITH ALPHANUMERIC NAMES FOR THE
VARIABLES WHICH WILL APPEAR ON THE PLOT

ADDITIONAL INFORMATION IS PROVIDED THRU LABELLED COMMON
BLOCK /PLO/

NRUN - NUMBER OF THIS RUN (DEFAULT: 1)

NPLO - NUMBER OF PLOT (DEFAULT: 1)

ITP - PAGE TITLE (DEFAULT: BLANK)

ITY - Y TITLE (DEFAULT: BLANK)

ITX - X TITLE (DEFAULT: BLANK)

(TITLE ARRAYS ARE 6 WORDS EACH OF UP TO 6
CHARACTERS PER WORD - 6A6 FORMAT)

NUMPAG - NUMBER OF DOUBLE PAGES TO SPREAD THE PLOT
OVER (NO MORE THAN 100 POINTS PER PAGE)
(DEFAULT: 1)

MAXSCA - SCALING OPTION

1 - OPTIMUM SCALING IS CALCULATED FOR EACH
VARIABLE (DEFAULT)

2 - PLOT ALL DEPENDENT VARIABLES ON THE
SAME SCALE

(IF THE PROGRAMMER SCALES ANY OF THE
DEPENDENT VARIABLES, THIS OPTION IS DEFAULTED)

SCA AND FROM -

ARRAYS CONTAINING THE INCREMENTS AND THE
STARTING VALUES FOR EACH VARIABLE.
IF ONE OF THESE ARRAYS IS USED FOR A VARIABLE,
BOTH MUST BE USED.
IF THERE ARE MORE THAN 101 VALUES FOR THE
INDEPENDENT VARIABLE, THOSE VALUES MUST HAVE A
CONSTANT INCREMENT AND THE SCALING IS ALWAYS
BASED ON THAT INCREMENT.
(DEFAULT: OPTIMUM SCALE AND STARTING VALUE
ARE CALCULATED FOR EACH VARIABLE)

REMEMBER TO PUT 'TAPENFILE' INTO PROGRAM STATEMENT OF THE
MAIN PROGRAM.

REMARKS

A CALL TO 'INITPLO' WILL SET THE DEFAULT VALUES.

THE MINIMUM SIZE OF A GRID IS 101 X 101 POINTS (THIS IS
1-1/2 COMPUTER PAGES). IF MORE THAN 101 VALUES FOR THE
INDEPENDENT VARIABLE ARE GIVEN, THE REQUIRED INTEGRAL
NUMBER OF 100-POINT GRIDS ARE AUTOMATICALLY JOINED TOGETHER.

THE NAME AND VALUES OF THE INDEPENDENT VARIABLE (AND
X TITLE) ARE GIVEN IN THE LEFT MARGIN. THE NAMES, SCALES
AND PLOTTING CHARACTERS (A-I) FOR THE DEPENDENT VARIABLES
ARE GIVEN AT THE TOP OF THE PAGE WITH THE PAGE TITLE AND
Y TITLE ABOVE THEM.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

ABS	ALOG10	AMAX1	AMIN1	AND
COMPL	EOF	OR	REWIND	SHIFT
OTHERS				
DRAWGD	(2218 CM)			
INITGD	(478 CM)			
INITPLO	(218 CM)			

LANGUAGE: FORTRAN IV

CM REQUIRED: 12028

AUTHOR

ADAPTED FROM MIMIC BY ANN BANDURSKI - NSROC CODE 1833

DATE WRITTEN: 05/22/72

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY ON TAPE LABELLED: CLIBRARYUPD3

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'POLYN'

PURPOSE

LEAST SQUARES POLYNOMIAL FIT

FUNCTIONAL CATEGORY: E2

LANGUAGE: FORTRAN

REMARKS

FIT AN N-TH DEGREE POLYNOMIAL TO SETS OF POINTS (X(I), Y(I), Z(I), ...), WHERE X IS THE INDEPENDENT VARIABLE IN EACH CASE, (I=1,2,...,N).

$$PN(X) = A(0) + A(1)*X + A(2)*X**2 + \dots + A(N)*X**N$$

USAGE

CALL POLYN (ND, NP, NC, X, Y, NAPT, A, V, SUM)

DESCRIPTION OF PARAMETERS

- ND - DEGREE OF POLYNOMIAL (N)
- NP - NUMBER OF POINTS IN SET OF OBSERVATIONS (X(I), Y(I), Z(I), ...)
- NC - NUMBER OF CURVES TO BE FITTED (E.G., Y, Z, ...)
- X - ARRAY CONTAINING THE DEPENDENT VARIABLE
- Y - ARRAY CONTAINING THE INDEPENDENT VARIABLE(S) MUST BE DIMENSIONED AT LEAST (NC,ND+1). Y(1), Y(2), ... MUST BE CONTIGUOUS IN MEMORY. Z(1) NEED NOT FOLLOW Y(N) IMMEDIATELY.
- NAPT - NUMBER OF LOCATIONS BETWEEN SETS OF DATA Y, Z, ... (NUMBER OF WORDS BETWEEN Y(N) AND Z(1).) ALL SETS Y, Z, ... MUST BE EQUALLY SPACED.
- A - WORK ARRAY USED IN MATRIX SOLUTION OF THE (ND+1) SETS OF LINEAR EQUATIONS. MUST BE DIMENSIONED AT LEAST (ND+1,ND+1).
- V - OUTPUT ARRAY USED IN MATRIX SOLUTION FOR VECTOR. MUST BE DIMENSIONED AT LEAST (NC,ND+1).
- SUM - WORK ARRAY FOR SUMS OF POWERS OF X. MUST BE DIMENSIONED AT LEAST (2*ND+1).

CM REQUIRED: 233B (+ 170B FOR ENXEN)

METHOD

LEAST SQUARES - MINIMIZING SUM OF SQUARES OF DEVIATIONS FROM AVERAGE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

PART OF PROGRAM

ENXEN

OTHERS

NONE

AUTHOR

J. N. BROOKS

DATE WRITTEN: 01/29/60

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED CLIBRARYUPD3 (DECK: ARPLN1)

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'PROOT'

PURPOSE

FIND ALL ROOTS OF A REAL POLYNOMIAL

FUNCTIONAL CATEGORY: C2 B4

LANGUAGE: FORTRAN IV

REMARKS

THE POLYNOMIAL HAS THE FORM:

$$A_1 + A_2 X + \dots + A_{N+1} X^{**N} = 0$$

USAGE

CALL PROOT (N, A, U, V, H, B, C, CONV, NPLUS2)

DESCRIPTION OF PARAMETERS

- N - DEGREE OF THE POLYNOMIAL TO BE SOLVED
- A - ARRAY (DIMENSIONED N+2) CONTAINING THE COEFFICIENTS IN THE ORDER INDICATED ABOVE
- U - ARRAY (DIMENSIONED N+2) WHICH WILL CONTAIN THE REAL PARTS OF THE ROOTS
- V - ARRAY (DIMENSIONED N+2) WHICH WILL CONTAIN THE IMAGINARY PARTS OF THE ROOTS
- H,B,C - WORK ARRAYS (EACH DIMENSIONED N+2)
- CONV - CONVERGENCE CRITERION. INITIALLY SET BY PROOT TO 1.0E-35 (FAR BELOW THE ACTUAL STARTING CONVERGENCE CRITERION OF 5.0E-20 (COC 6600)). IF THE POLYNOMIAL HAS NOT CONVERGED AFTER A PRESCRIBED NUMBER OF TRIES, THE CONVERGENCE CRITERION IS RELAXED. IF, UPON EXIT FROM PROOT, CONV IS NOT 1.0E-35, THE CONVERGENCE CRITERION HAS BEEN RELAXED TO THE NUMBER GIVEN.

NPLUS2 - MUST BE SET TO N+2

GM REQUIRED: 4638

METHOD

THE ROUTINE CONVERGES SIMULTANEOUSLY TOWARD A LINEAR FACTOR AND A QUADRATIC FACTOR BY NEWTON'S AND BAIRSTOW'S METHODS, RESPECTIVELY. WHEN A ROOT IS FOUND BY ONE METHOD, ITERATION CONTINUES WITH BOTH METHODS USING THEIR MOST RECENT GUESSES.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

ABS SIGN SQRT

OTHERS

NONE

AUTHORS

MIRIAM SHAPIRO

HARVEY ABRAMSON - NEW YORK UNIVERSITY

DATE WRITTEN: UNKNOWN - ADAPTED FROM LOS ALAMOS ROUTINE
LA-PROOT BY T. L. VORDAN (MS)

DATE(S) REVISED

11/65 - CONVERTED TO CDC 6600 (HA)

LOCATION OF DECKS

SOURCE

TAPE LABELLED: CLIBRARYUPD3

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'PRTFL'

PURPOSE

PRINT CURRENT FL (OR PUT INTO DAYFILE)

FUNCTIONAL CATEGORIES: Q0 J2

USAGE

CALL PRTFL (IOUT)

DESCRIPTION OF PARAMETER

IOUT - FORTRAN LOGICAL UNIT NUMBER

(0=PUT INTO DAYFILE; N=WRITE ON TAPEN)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

REMARK

OTHERS

FTNRFL - GET CURRENT FL

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 50B

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 04/16/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'PRTIME'

PURPOSE

GET AND PRINT CPA, CPB, CP, PP, IO AND WALL CLOCK TIMES
SINCE LAST CALL AND PRINT USER-SUPPLIED MESSAGE

FUNCTIONAL CATEGORIES: Q4 J4 N0

USAGE

CALL PRTIME (IOUNIT, TIMES, MSG)
CALL PRTIME (IOUNIT, TIMES, 0)

DESCRIPTION OF PARAMETERS

IOUNIT - OUTPUT UNIT FOR PRINTED LINE
(EITHER FORTRAN LOGICAL UNIT NUMBER (1-99) OR
1- TO 7-CHARACTER LOCAL FILE NAME, LEFT-ADJ,
ZERO-FILLED (E.G., 6LOUTPUT))

TIMES - 7-WORD ARRAY TO CONTAIN THE FOLLOWING:
1 - ELAPSED CPA TIME IN SECONDS
2 - ELAPSED CPB TIME IN SECONDS
3 - ELAPSED CP TIME IN SECONDS (CPA+CPB)
4 - ELAPSED PP TIME IN SECONDS
5 - ELAPSED IO TIME IN SECONDS
6 - ELAPSED WALL CLOCK TIME (HH.MM.SS.)
7 - ELAPSED WALL CLOCK TIME IN SECONDS

MSG - 5-WORD MESSAGE TO BE PRINTED
(IF SUPPLIED AS HOLLERITH CONSTANT, MAY BE FEWER
THAN 5 WORDS. SEE EXAMPLE BELOW)
(IF MSG(1) IS 0 (OR 1L0 OR 1H0), HEADINGS, BUT NOT
TIMES, WILL BE PRINTED.)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

FLTIME - GET ELAPSED TIME SINCE LAST CALL
FINDCHR - FIND FIRST OCCURRENCE OF CHARACTER IN ARRAY

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

OUTPUT UNITS

UNIT #	LEN	USE
-----	-----	-----
USER SPECIFIES...	LISTABLE OUTPUT	

CM REQUIRED: 102B

EXAMPLE

```
      PROGRAM TEST (OUTPUT=128, .....  
      REAL TIMES(7)  
C     GET INITIAL TIMES AND PRINT HEADING  
      CALL PRTIME (6LOUTPUT, TIMES, 0)  
      .....  
C     GET ELAPSED TIMES AND PRINT WITH MESSAGE  
      CALL PRTIME (6LOUTPUT, TIMES, "TEST NUMBER 1")  
      ...  
C     NEW HEADINGS ARE NOT NEEDED, SO CALL ELTIME DIRECTLY  
      CALL ELTIME (TIMES)  
      .....  
C     GET ELAPSED TIMES AND PRINT WITH MESSAGE  
      CALL PRTIME (6LOUTPUT, TIMES, "TEST NUMBER 2")  
      ...  
      END
```

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 04/20/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'PUTCHA'
FUNCTION 'PUTCHA'

PURPOSE

INSERT CHARACTER INTO SPECIFIED POSITION IN AN ARRAY

FUNCTIONAL CATEGORY: M4

USAGE

CALL PUTCHA (A, N, CH)
VARIABLE = PUTCHA (A, N, CH)

DESCRIPTION OF PARAMETERS

A - ARRAY INTO WHICH CHARACTER IS TO BE INSERTED
N - POSITION AT WHICH CHARACTER IS TO BE INSERTED
(POSITION 1 IS LEFT-MOST 6-BIT CHARACTER IN A(1))
CH - CHARACTER TO BE INSERTED (IN 1R FORMAT)
(WHEN USED AS A FUNCTION, PUTCHA WILL CONTAIN THE WORD
IN 'A' WHICH WAS CHANGED)

REMARKS

'PUTCHA' IS AN ENTRY POINT IN 'GETCHA'.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE

SHIFT
OTHERS
NONE

ARITHMETIC STATEMENT FUNCTIONS
NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 52B (UNLESS GETCHA IS ALSO CALLED)

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 03/16/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'PUTCHR'
FUNCTION 'PUTCHR'

PURPOSE

INSERT CHARACTER INTO SPECIFIED POSITION IN A WORD

FUNCTIONAL CATEGORY: M4

USAGE

CALL PUTCHR (A, N, CH)
VARIABLE = PUTCHR (A, N, CH)

DESCRIPTION OF PARAMETERS

A - WORD INTO WHICH CHARACTER IS TO BE INSERTED
N - POSITION AT WHICH CHARACTER IS TO BE INSERTED
(POSITION 1 IS LEFT-MOST 6-BIT CHARACTER IN A)
CH - CHARACTER TO BE INSERTED (IN 14 FORMAT)
(WHEN USED AS A FUNCTION, PUTCHR WILL CONTAIN THE SAME
AS 'A')

REMARKS

'PUTCHR' IS AN ENTRY POINT IN 'GETCHR'.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 43B (UNLESS GETCHR IS ALSO CALLED)

AUTHOR

FROM 31MED PACKAGE

DATE WRITTEN:

DATE(S) REVISED

1975 - DAVID V SOMMER - DTNSRJC CODE 1892.2

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'QSORT'

PURPOSE

IN-CORE ASCENDING SORT FOR ARRAYS LARGER THAN 500 WORDS

FUNCTIONAL CATEGORY: M1

USAGE

CALL QSORT (A, I)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SORTED INTO ASCENDING ORDER

I - NUMBER OF WORDS IN 'A' TO BE SORTED

REMARKS

'QSORT' IS THE MOST EFFICIENT SORT AVAILABLE (AS OF DATE BELOW) FOR THE SORTING IN CORE OF ARRAYS LARGER THAN 500 WORDS.

THIS ROUTINE IS A TRANSLATION OF ALGORITHM 402, COMM. ACM NOV, 1970.

IF THE JOB ABORTS WITH THE 'P' COUNTER IN QSORT, CHECK IF MN EXCEEDS KL. IF SO, WRITE DUMMY SUBROUTINE TO SET KL AND THE DIMENSION OF K GREATER.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 216B + 57B COMMON

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 11/25/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'QSORT1'

PURPOSE

IN-CORE ASCENDING SORT WITH RE-ORDERING OF ASSOCIATED ARRAY
(FOR ARRAYS LARGER THAN 500 WORDS)

FUNCTIONAL CATEGORY: M1

USAGE

CALL QSORT1 (A, I, T)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SORTED INTO ASCENDING ORDER
I - NUMBER OF WORDS IN 'A' TO BE SORTED
T - ASSOCIATED ARRAY TO BE REORDERED

REMARKS

'QSORT1' IS THE MOST EFFICIENT SORT AVAILABLE (AS OF DATE
BELOW) FOR THE SORTING IN CORE OF ARRAYS LARGER THAN 500
WORDS.

THIS ROUTINE IS A TRANSLATION OF ALGORITHM 402, COMM. ACM
NOV, 1970.

IF THE ARRAY 'T' IS NOT NEEDED, USE 'QSORT'.

IF THE JOB ABORTS WITH THE 'P' CONTER IN QSORT1, CHECK IF
MN EXCEEDS KL. IF SO, WRITE DUMMY SUBROUTINE TO SET KL
AND THE DIMENSION OF K GREATER.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCF

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 2668 + 578 COMMON

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 11/30/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'RCPA'

PURPOSE

READ (A PORTION OF) CONTROL POINT AREA

FUNCTIONAL CATEGORY: K2

USAGE

CALL RCPA (ISTART, NWORDS, AREA)

DESCRIPTION OF PARAMETERS

ISTART - STARTING WORD IN CONTROL POINT AREA

NWORDS - NUMBER OF WORDS TO READ

AREA - ARRAY TO HOLD THE SPECIFIED WORDS
(AREA(2) THRU AREA(NWORDS+1))

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 439

AUTHOR

MIKE GOLDEN - DTNSRDC CODE 1844

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 11/75

DATE(S) REVISED

12/03/75

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'RECOVRD'

PURPOSE

ON RECOVERY, PRINT EXCHANGE JUMP PACKAGE, RA+0 THRU RA+77B
AND ENDRUN INDICATOR

FUNCTIONAL CATEGORIES: J9 N2

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

```
...  
EXTERNAL RECOVRD  
...  
CALL RECOVR (RECOVRD, 77B, 0)  
...  
--OR--  
  
...  
EXTERNAL ANY  
...  
CALL RECOVR (ANY, 77B, 0)  
...  
SUBROUTINE ANY (EXCHJP, ENDRUN, RA0)  
DIMENSION EXCHJP(17)  
CALL RECOVR (EXCHJP, ENDRUN, RA0)  
...
```

DESCRIPTION OF PARAMETERS

EXCHJP - 17-WORD ARRAY TO HOLD EXCHANGE JUMP PACKAGE
ENDRUN - ENDRUN INDICATOR (WILL HAVE MEANING ONLY IF SECOND
FORM OF USAGE IS USED AND IF ENDRUN IS SET BEFORE
THE CALL TO RECOVRD)
RA0 - RA+0 POINTER (NOT USED BY THIS SUBROUTINE)

CM REQUIRED: 601B

OUTPUT UNITS

LFN USE

OUTPUT LISTABLE OUTPUT

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

GETRA - GET RA+0 THRU RA+77B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 06/19/74

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'REDUCE'

PURPOSE

REDUCE FL TO MINIMUM OR REQUEST ADDITIONAL FL RELATIVE TO
START OF BLANK COMMON

FUNCTIONAL CATEGORY: Q0

USAGE

CALL REDUCE - REDUCE TO FIRST WORD OF BLANK COMMON
CALL REDUCE (I) - ADJUST TO 'I' WORDS AFTER START OF BLANK
COMMON

DESCRIPTION OF PARAMETER

I - IF PRESENT, NUMBER OF WORDS PAST START OF BLANK COMMON

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF

SHIFT

OTHERS

MFETCH - GET SPECIFIED WORD IN USER'S FL

MSET - SET SPECIFIED WORD IN USER'S FL

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 368 (PLUS 1 IN BLANK COMMON)

AUTHOR

? - NWL

DATE WRITTEN: ?

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

TAPE LABELLED CSYSNSRDCPL; P.F. NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'REPLAC'

PURPOSE

REPLACE ONE CHARACTER BY ANOTHER IN AN ARRAY

FUNCTIONAL CATEGORY: M4

USAGE

CALL REPLAC (A, NA, OLD, NEW)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE PROCESSED
NA - NUMBER OF WORDS IN 'A' TO BE PROCESSED
OLD - OLD CHARACTER (1R FORMAT)
NEW - NEW CHARACTER (1R FORMAT)

REMARKS

ALL PARAMETERS ARE TYPE 'INTEGER'

SUBROUTINE AND FUNCTIONS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

L91FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)
R110FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

CM REQUIRED: 578

AUTHOR

DAVID V SOMMER - DTNSTDC CODE 1892.2

DATE WRITTEN: 1973

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'REPLACH'

PURPOSE

REPLACE OLD CHARACTERS WITH NEW CHARACTERS

FUNCTIONAL CATEGORY: M4

USAGE

CALL REPLACH (A, NA, OLD, NEW, NCH)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE PROCESSED
NA - NUMBER OF WORDS IN 'A' TO BE PROCESSED
OLD - ARRAY OF OLD CHARACTERS (1R FORMAT)
NEW - ARRAY OF CORRESPONDING NEW CHARACTERS (1R FORMAT)
NCH - NUMBER OF CHANGE PAIRS (DIMENSION OF 'OLD' AND 'NEW')

REMARKS

ALL ARGUMENTS ARE TYPE 'INTEGER'.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

L91FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

R110FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

GM REQUIRED: 73B

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 05/21/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'REPLHI'

PURPOSE

REPLACE ALL CHARACTERS GREATER THAN SPECIFIED CHARACTER WITH
NEW CHARACTER

FUNCTIONAL CATEGORY: M4

USAGE

CALL REPLHI (A, NA, OLD, NEW)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE PROCESSED
NA - NUMBER OF WORDS IN 'A' TO BE PROCESSED
OLD - OLD CHARACTER (1R FORMAT)
NEW - NEW CHARACTER (1R FORMAT)

REMARKS

ALL PARAMETERS ARE TYPE 'INTEGER'

SUBROUTINE AND FUNCTIONS REQUIRED

PART OF LANGUAGE
SHIFT
OTHERS
NONE

ARITHMETIC STATEMENT FUNCTIONS

L91FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)
R110FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

CM REQUIRED: 608

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 01/26/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL,ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'REPLLO'

PURPOSE

REPLACE ALL CHARACTERS LESS THAN SPECIFIED CHARACTER WITH
NEW CHARACTER

FUNCTIONAL CATEGORY: M4

USAGE

CALL REPLLO (A, NA, OLD, NEW)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE PROCESSED
NA - NUMBER OF WORDS IN 'A' TO BE PROCESSED
OLD - OLD CHARACTER (1R FORMAT)
NEW - NEW CHARACTER (1R FORMAT)

REMARKS

ALL PARAMETERS ARE TYPE 'INTEGER'

SUBROUTINE AND FUNCTIONS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

L91FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

R11DFMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

GM REQUIRED: 608

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 01/26/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'REPLNE'

PURPOSE

REPLACE ALL CHARACTERS (EXCEPT SPECIFIED CHARACTER) WITH A
SPECIFIED CHARACTER

FUNCTIONAL CATEGORY: M4

USAGE

CALL REPLNE (A, NA, OLD, NEW)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE PROCESSED
NA - NUMBER OF WORDS IN 'A' TO BE PROCESSED
OLD - OLD CHARACTER (1R FORMAT)
NEW - NEW CHARACTER (1R FORMAT)

REMARKS

ALL PARAMETERS ARE TYPE 'INTEGER'

SUBROUTINE AND FUNCTIONS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

L91FMT - FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)
R110FMT - FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

LANGUAGE: FORTRAN IV

CM REQUIRED: 57B

AUTHOR

DAVID V SOMMER - DTNSTDC CODE 1892.2

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'REQUEST'

PURPOSE

CALLABLE REQUEST FUNCTION

FUNCTIONAL CATEGORY: Q3

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

ASSIGNMENT OF EQUIPMENT MAY BE REQUESTED FROM A RUNNING
CENTRAL PROCESSOR PROGRAM BY THE REQUEST SUBROUTINE, WHICH
HAS THE EFFECT OF A REQUEST CARD.

FOR FURTHER INFORMATION, CALL

MIKE CHERNICK

(202) 227-1683 OR IDS 150-1683 OR AUTOVON 287-1683

USAGE

CALL REQUEST (IRC, LFN, ICODE, SN)

CALL REQUEST (IRC, LFN, ICODE)

CALL REQUEST (IRC, LFN)

DESCRIPTION OF PARAMETERS

- IRC - OUTPUT: RIGHT-JUSTIFIED SCOPE-GENERATED ERROR
RETURN CODE
IRC=0 - REQUEST WAS SUCCESSFUL
- LFN - CONTENTS DETERMINED BY ICODE
IF ICODE IS NON-ZERO, LFN IS A 1-7 CHARACTER LOCAL
FILE NAME, LEFT-JUSTIFIED, ZERO- OR BLANK-FILLED
(E.G., 5LTAPE7).
IF ICODE IS ZERO (OR MISSING), LFN IS AN ARRAY
CONSTRUCTED AS DESCRIBED IN SCOPE REFERENCE
MANUAL, PAGE 12-23 ON.
- ICODE - DETERMINES CONTENTS OF LFN AND EFFECT OF REQUEST
ICODE 0 OR MISSING - LFN IS AN ARRAY CONTAINING
PARAMETERS FOR REQUEST MACRO
ICODE = "*Q", 2H*Q OR 2L*Q - LFN IS 1-7 CHARACTER
LOCAL FILE NAME AND REQUEST HAS EFFECT OF
REQUEST,LFN,*Q.
ICODE ANYTHING ELSE - LFN IS 1-7 CHARACTER LOCAL
FILE NAME AND REQUEST HAS THE EFFECT OF
REQUEST,LFN,*PF.
- SN - OPTIONAL SN (*PF ONLY)
WHEN USED, IS 1-7 CHARACTER USER DEVICE SET NAME
(HAS EFFECT OF REQUEST,LFN,*PF,SN=SETNAME.)

GM REQUIRED: 1258

EXAMPLES

REQUEST,TAPE1,*PF. BECOMES
CALL REQUEST (IRC, 5LTAPE1, 1)

REQUEST,TAPE2,*Q. BECOMES
CALL REQUEST (IRC, 5LTAPE2, "*Q")

REQUEST,TAPE3,*PF,SN=MYSET1. BECOMES
CALL REQUEST (IRC, "TAPE3", "*PF", "MYSET1")

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF SHIFT

OTHERS

IZONK NUMVAR ZPFMAC

AUTHORS

JAMES BLACK, MIKE CHERNICK - DTNSRDC CODE 1832

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 05/26/71

DATE(S) REVISED

01/10/75 - V3.5 - MC

01/27/77 - DVS - ADD *Q

03/24/77 - DVS - ADD SN

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ROUTE'

PURPOSE

CALLABLE ROUTE COMMAND

FUNCTIONAL CATEGORY: Q3

LANGUAGE: FORTRAN IV EXTENDED AND CDC 6000 COMPASS

REMARKS

THE FILE TO BE ROUTED MUST BE ON A QUEUE DEVICE.

THE CALLING PROGRAM MUST CLOSE THE FILE BEFORE 'ROUTE' IS CALLED. A FTN SEQUENTIAL FILE (WRITE, PRINT, PUNCH) MAY BE "CLOSED" BY ISSUING A 'REWIND N' BEFORE THE CALL TO 'ROUTE'. IF THE FILE IS NOT CLOSED, THE FINAL BUFFER MAY NOT BE ROUTED.

USAGE

CALL ROUTE (IRC, IPRMS, NW)

CALL ROUTE (IRC, IPRMS)

DESCRIPTION OF PARAMETERS

IRC - ERROR RETURN CODE

SCOPE-GENERATED

DEC	OCT	MEANING
---	---	-----
1	001	INVALID LFN - DSP
2	002	CANNOT ROUTE NON-ALLOCATABLE EQUIPMENT
3	003	CANNOT ROUTE PERMANENT FILE
4	004	NO PERMISSION TO ROUTE THIS FILE
5	005	ROUTE TO INPUT NOT IMMEDIATE - IGNORED
6	006	IMMEDIATE ROUTING - NO FILE - IGNORED
7	007	INVALID DISPOSITION CODE - ROUTING IGNORED
8	010	INVALID FID - ROUTING IGNORED
9	011	DSP ABORTED BY SYSTEM
10	012	DSP PARAMETER OUTSIDE FL
11	013	PRIORITY SPECIFICATION IGNORED
12	014	RESERVED
13	015	E1200 SPECIFIED - INTERCOM USED (DSP)
14	016	CANNOT ROUTE INPUT FILE
15	017	DSP COMPLETE BIT ALREADY SET
16	020	FILE ON DISMOUNTABLE DEVICE - ROUTING IGNORED
17	021	TID NOT ALPHANUMERIC - ROUTING IGNORED
18	022	FORMS CODE NOT ALPHANUMERIC - ROUTING IGNORED
19	023	INVALID LINK TYPE - ROUTING IGNORED (DSP)
20	024	FILE NOT ON QUEUE DEVICE - ROUTING IGNORED
21	025	PRE-DAYFILE LFN AND NO DC=IN - ROUTE IGNORED
22	026	PRE-DAYFILE FILE NOT FOUND - ROUTE IGNORED

IPRMS - PARAMETERS FOR ROUTE

IPRMS	CONTENTS	FORMAT
1	LFN	1-7 CHAR, LEFT**
2	DC	0 FOR DEFAULT -OR- 2-CHAR DISPOSITION CODE, LEFT**
3	TID	0 -OR- 1LC - ROUTE TO CENTRAL SITE -OR- 2-CHAR TERMINAL ID, LEFT** -OR- 4LHERE - ROUTE TO THIS TERMINAL
4	FID	1-7 CHAR FILE ID -OR- 1L* -OR- 1-5 CHAR FILE ID, PRECEDED BY * (ALL LEFT**)
5	DEF	0 -OR- 3LDEF - TO DEFER ROUTING UNTIL END-OF-JOB
6		NON-ZERO TO RETURN THE JOB NAME IN THIS WORD
7	FC	0 -OR- 2-CHAR FORMS CODE, LEFT**
8	EC	0 - USE DEFAULT FOR PRINT: 2LB4, 2LB6, 2LA6, 2LA9 FOR PUNCH: 2LS8, 5LB0COL, 3L026, 3L029, 5LASCII
9	IC	ONE OF: 0 OR 3LDIS - DISPLAY CODE 5LASCII - ASCII 3LBIN - BINARY
10	STID	3-CHAR STATION ID, LEFT**
11	PRI	PRIORITY FOR INTERACTIVELY ROUTED OUTPUT FILE BEING ROUTED TO THE ROUTING TERMINAL - 1-4 DIGIT OCTAL VALUE (00008-77778)
12	REP	FOR ALL OTHER FILES - 0 REPEAT COUNT (0-31 (379))

** LEFT=LEFT-JUSTIFIED, BLANK OR ZERO PADDED

NW - NUMBER OF LAST ELEMENT IN IPRMS (OPTIONAL)
(IF OMITTED, NW=12)

CM REQUIRED: 3419

EXAMPLES

ASSUME THE PROGRAM HAS WRITTEN FILE 'TAPE7' TO BE
PRINTED AT CENTRAL SITE:

```

...
INTEGER IPRMS(12)
...
IPRMS(1) = 5LTAPE7
IPRMS(2) = 2LPR
IPRMS(3) = 1LC
IPRMS(4) = 1L*
...
REWIND 7
CALL ROUTE (IRC, IPRMS, 4)
...

```

THIS WILL SIMULATE THE FOLLOWING ROUTE COMMAND:

ROUTE,TAPE7,DC=PR,TID=C,FID=*.

A PROGRAM WISHES TO PUNCH FILE 'PUNCH' AT REMOTE
TERMINAL 'AE' AT END OF JOB:

```

...
INTEGER IPRMS(12)
...
IPRMS(1) = 5LPUNCH
IPRMS(2) = 2LPJ
IPRMS(3) = 2LAE
IPRMS(4) = 1L*
IPRMS(5) = 3LDEF
IPRMS(6) = 1
...
CALL ROUTE (IRC, IPRMS, 6)
IF (IRC .EQ. 0) PRINT 1, IPRMS(6)
1 FORMAT (" TAPE7 WILL BE PRINTED WITH JOB NAME " A7)
...

```

THIS WILL SIMULATE THE FOLLOWING ROUTE COMMAND:

ROUTE,PUNCH,DC=PU,TID=AE,FID=*,DEF.

A PROGRAM CREATES A 'JOB' ON FILE 'TAPE99' TO BE SUBMITTED
TO THE SAME INPUT QUEUE AS THE CREATING JOB:

```

...
INTEGER IPRMS(12)
...
IPRMS(1) = 6LTAPE99
IPRMS(2) = 2LIN
IPRMS(3) = 4LHERE
...
WRITE (99, 1)
99 FORMAT ("JOB CARD" / "CHARGE CARD" / "....")
CALL ROUTE (IRC, IPRMS, 3)

```

THIS WILL SIMULATE THE FOLLOWING ROUTE COMMAND:

ROUTE,TAPE99,DC=IN,TID.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOC MAX0 MIN0 MOVLEV SHIFT

PART OF PROGRAM

NONE

OTHERS

BZFILL - CHANGE BLANKS TO 008

HERE - GET TERMINAL IS FOR THIS JOB

TRAILBZ - CHANGE TRAILING BLANKS TO 008

ZSYSEQ - CALL THE SYSTEM

ARITHMETIC STATEMENT FUNCTIONS

FAST L-FORMAT DECODE (LEFT-ADJ, ZERO-FILLED)

L11FMT L21FMT L31FMT L52FMT L71FMT

FAST R-FORMAT DECODE (RIGHT-ADJ, ZERO-FILLED)

R18FMT R21FMT

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 12/08/75

DATE(S) REVISED

01/24/77 - ADD REP PARAMETER, CHANGE PRI DESCRIPTION

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SBYT'
FUNCTION 'SBYT'

PURPOSE
STORE VARIABLE LENGTH BYTE

FUNCTIONAL CATEGORY: M4

USAGE
CALL SBYT (N, LENGTH, INTO, FROM)
-OR-
VARIABLE = SBYT (N, LENGTH, INTO, FROM)

DESCRIPTION OF PARAMETERS
N - BEGINNING BIT POSITION IN WORD <INTO> WHERE THE
BYTE WILL BE PLACED. BITS ARE NUMBERED FROM 1 TO
60 FROM RIGHT TO LEFT.
LENGTH - LENGTH OF THE BYTE IN BITS. THIS LENGTH STARTS
WITH THE RIGHTMOST BIT OF <FROM>.
INTO - WORD INTO WHICH THE BYTE WILL BE PLACED.
FROM - WORD FROM WHICH THE BYTE WILL BE TAKEN FROM THE
LOW ORDER BITS.

NOTE: IN THE SECOND FORM, <VARIABLE> AND <INTO> WILL
CONTAIN THE SAME VALUE. THUS, THEY MAY HAVE THE
SAME VARIABLE NAME.

NOTE: BITS 1 THRU <LENGTH> OF WORD <FROM> ARE PLACED INTO
BITS <N> THRU (N+LENGTH-1) OF <INTO>.

REMARKS
STORES A 1 TO 60-BIT BYTE FROM ONE WORD INTO ANY POSITION IN
A SECOND WORD WITHOUT DISTURBING THE REMAINING PART OF THAT
WORD.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
NONE

EXAMPLE
I = 7777 1111 2222 5555 4444B
J = 3333 2222 1111 5555 4436B
AA = SBYT (37, 6, I, J)

RESULTS IN
AA = 7777 1136 2222 5555 4444B
I = 7777 1136 2222 5555 4444B

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 20B

AUTHOR: FROM CDC KRONOS SYSTEM

DATE WRITTEN:

LOCATION OF DECKS
SOURCE: UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT: EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SEMICO'

PURPOSE

REPLACE DISPLAY CODE 003 WITH 77B (SEMI-COLON)

FUNCTIONAL CATEGORY: M4

USAGE

CALL SEMICO (IA, I)

DESCRIPTION OF PARAMETERS

IA - (ARRAY) TO BE PROCESSED

I - NUMBER OF WORDS IN 'IA' TO BE PROCESSED

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

GM REQUIRED: 37B

AUTHOR

? - NWL

DATE WRITTEN: ?

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SETREW'

PURPOSE

CONVERT REWIND OPTION INTO RM OPEN AND CLOSE CODES

FUNCTIONAL CATEGORY: M4

USAGE

CALL SETREW (REW, OPEN, CLOSE, NOE)

CALL SETREW (REW, OPEN, CLOSE)

DESCRIPTION OF PARAMETERS

REW - INPUT REWIND OPTION. ONE OF:
A - OPEN=NOREWIND; CLOSE=REWIND
B - OPEN=REWIND ; CLOSE=NOREWIND
E - OPEN=POSITION BEFORE END-OF-INFORMATION;
CLOSE=NOREWIND
EN - OPEN=POSITION BEFORE EOI; CLOSE=NOREWIND
ER - OPEN=POSITION BEFORE EOI; CLOSE=REWIND
EU - OPEN=POSITION BEFORE EOI; CLOSE=UNLOAD
R - OPEN=REWIND ; CLOSE=REWIND
U - OPEN=REWIND ; CLOSE=REWIND AND UNLOAD
OTHER - OPEN=NOREWIND; CLOSE=NOREWIND
(ANY WORDS BEGINNING WITH THESE LETTERS WILL
PRODUCE THE SAME RESULTS. ONLY THE FIRST 1
OR 2 LETTERS ARE RETURNED IN L-FORMAT)
OPEN - WILL CONTAIN OPEN REWIND OPTION (1LE, 1LN, 1LR)
CLOSE - WILL CONTAIN CLOSE REWIND OPTION (1LN, 1LR, 1LU)
NOE - OMITTED OR 0 - ALLOW ALL VALUES OF REW
OTHER - DO NOT ALLOW 'E' VALUES OF REW

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF

OTHERS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 113B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 10/29/75

DATE(S) REVISED

01/29/76

01/11/76 - ADD 'NOE' PARAMETER

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SHIFTA'

PURPOSE

SHIFT ARRAY SPECIFIED NUMBER OF BITS (CROSSING OVER WORD
BOUNDARIES)

FUNCTIONAL CATEGORY: M4

USAGE

CALL SHIFTA (A, B, N, NBITS)

DESCRIPTION OF PARAMETERS

A - INPUT ARRAY OF DIMENSION 'N'
B - OUTPUT ARRAY OF DIMENSION 'N+1'
(MAY NOT BE SAME AS 'A')
N - NUMBER OF WORDS TO BE PROCESSED
NBITS - NUMBER OF BITS TO SHIFT
 <0 - SHIFT TO LEFT
 (LEFTMOST BITS LOST, TRAILING BITS SET TO 0,
 B(N+1) NOT DEFINED)
 =0 - JUST MOVE (B(N+1) IS SET TO 0)
 >0 - SHIFT TO RIGHT
 (LEADING AND TRAILING BITS SET TO 0)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 1163

AUTHOR

DAVID V SOMMER - DTNSROC CODE 1892.2

DATE WRITTEN: 04/26/74

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SKWEZL'

PURPOSE

SQUEEZE LEFT AND REMOVE BLANKS AND 009

FUNCTIONAL CATEGORY: M4

USAGE

CALL SKWEZL (A, NA, NC, NW)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SQUEEZED
(WILL BE REPLACED BY SQUEEZED ARRAY)
NA - NUMBER OF WORDS TO BE SQUEEZED
NC - OUTPUT NUMBER OF CHARACTERS IN SQUEEZED ARRAY
NW - OUTPUT NUMBER OF WORDS IN SQUEEZED ARRAY

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

GETCHA - EXTRACT CHARACTER FROM ARRAY
PUTCHA - PUT CHARACTER INTO ARRAY

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 111B

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 03/19/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SKWEZR'

PURPOSE

SQUEEZE RIGHT AND REMOVE BLANKS AND 008

FUNCTIONAL CATEGORY: M4

USAGE

CALL SKWEZR (A, NA, NC, NW)

DESCRIPTION OF PARAMETERS

- A - ARRAY TO BE SQUEEZED
(WILL BE REPLACED BY SQUEEZED ARRAY)
- NA - NUMBER OF WORDS TO BE SQUEEZED
- NC - OUTPUT POSITION OF FIRST NON-ZERO CHARACTERS IN
SQUEEZED ARRAY (POSITION 1 IS LEFTMOST CHARACTER IN
A(1))
- NW - OUTPUT SUBSCRIPT OF FIRST NON-ZERO WORD

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

- GETCHA - EXTRACT CHARACTER FROM ARRAY
- PUTCHA - PUT CHARACTER INTO ARRAY

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 1158

AUTHOR

DAVID V SOMMER - DTNSRQC CODE 1892.2

DATE WRITTEN: 03/19/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SNCNDN'

PURPOSE

EVALUATE THE THREE JACOBIAN ELLIPTIC FUNCTIONS

FUNCTIONAL CATEGORY: C3

LANGUAGE: FORTRAN IV

REMARKS

IF CM=0 AND ABS(X) > (2K/PI)*6.87E10, WHERE K IS THE QUARTER PERIOD OF SN, THE ERROR MESSAGE
SNCNDN ARGUMENT X TOO LARGE. X=
IS PRINTED ON FILE 'OUTPUT'.

USAGE

CALL SNCNDN (X, CM, SN, CN, DN)

DESCRIPTION OF PARAMETERS

X - INPUT PARAMETER
CM - INPUT PARAMETER
SN - OUTPUT PARAMETER - WILL CONTAIN THE VALUE OF SN(X,K)
CN - OUTPUT PARAMETER - WILL CONTAIN THE VALUE OF CN(X,K)
DN - OUTPUT PARAMETER - WILL CONTAIN THE VALUE OF DN(X,K)

CM REQUIRED: 3103

OUTPUT UNITS

UNIT #	LFN	USE
-----	-----	-----
	OUTPUT	ERROR MESSAGE (SEE REMARKS)

METHOD

GAUSS TRANSFORMATION

REFERENCE

BULIRSCH, R, "NUMERICAL CALCULATIONS OF ELLIPTIC INTEGRALS AND ELLIPTIC FUNCTIONS", NUMERISCHE MATHEMATIK, 7, 1965, PP. 78-90

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE	ABS	EXP	SIGN	SIN	SQRT
OTHERS					
NONE					

AUTHOR

R BULIRSCH

DATE WRITTEN: 01/68

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
TAPE LABELLED: CLIBRARYUPD3
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SSORT'

PURPOSE

FTN SHELL SORT

FUNCTIONAL CATEGORY: M1

USAGE

CALL SSORT (A, I, T)

CALL SSORT (A, I)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SORTED

I - NUMBER OF ELEMENTS TO BE SORTED

T - IF PRESENT, AN ASSOCIATED ARRAY RE-ORDERED TO MAINTAIN
1 TO 1 CORRESPONDENCE WITH THE ELEMENTS OF ARRAY 'A'

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOGF

SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 1168

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 12/07/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SSORTF'

PURPOSE

FTN CALLABLE SHELL SORT FOR TWO-DIMENSIONAL ARRAYS

FUNCTIONAL CATEGORY: M1

LANGUAGE: FORTRAN IV

REMARKS

THIS ROUTINE IS INEFFICIENT IF M .GT. 10.

USAGE

CALL SSORTF (A, TEMP, M, N, I)

CALL SSORTF (A, TEMP, M, N)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SORTED

TEMP - TEMPORARY ARRAY OF DIMENSION M USED IN THE SORT

M - NUMBER OF WORDS PER ITEM

N - NUMBER OF ITEMS PER ARRAY

(DIMENSION OF A IS A(M,N))

I - IF PRESENT, NUMBER FROM 1 TO M SPECIFYING ON WHICH
WORD OF AN ITEM TO SORT.

IF OMITTED, I=1.

CM REQUIRED: 117B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOC MOVLEV SHIFT

OTHERS

NONE

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 01/10/71

DATE(S) REVISED

11/23/76 - DVS - DTNSRDC - CHANGE SUBROUTINE SENT TO MOVLEV

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SSORTI'

PURPOSE

FTN CALLABLE SHELL SORT FOR TWO-DIMENSIONAL ARRAYS

FUNCTIONAL CATEGORY: M1

USAGE

CALL SSORTI (A, TEMP, M, N, I)

CALL SSORTI (A, TEMP, M, N)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SORTED

TEMP - TEMPORARY ARRAY OF DIMENSION M USED IN THE SORT

M - NUMBER OF WORDS PER ITEM

N - NUMBER OF ITEMS PER ARRAY
(DIMENSION OF A IS A(M,N))

I - IF PRESENT, NUMBER FROM 1 TO M SPECIFYING ON WHICH
WORD OF AN ITEM THE ARRAY IS TO BE SORTED.
IF ABSENT, THE ARRAY WILL BE SORTED ON THE FIRST
WORD (I=1).

REMARKS

THIS ROUTINE IS INEFFICIENT IF M .GT. 10.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCF MOVLEV SHIFT

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

GM REQUIRED: 1538

AUTHOR

C FLINK - KPS NWL

ALBAN P GASS - NWL

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 01/10/71

DATE(S) REVISED

03/10/74 - APG - CHANGE FROM REAL TO INTEGER

06/09/76 - DVS - CHANGE SUBROUTINE SENT TO MOVLEV

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'SSORTL'

PURPOSE

FTN LOGICAL SHELL SORT

FUNCTIONAL CATEGORY: M1

USAGE

CALL SSORTL (A, I, M, T)

CALL SSORTL (A, I, M)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE SORTED

I - NUMBER OF ELEMENTS IN ARRAY 'A' TO BE SORTED

M - MASK WORD WITH THE RELEVANT BITS SET

T - IF PRESENT, ASSOCIATED ARRAY, RE-ORDERED SUCH THAT
A(K) STILL RELATES TO T(K)

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

LOCF

SHIFT

OTHERS

EQU60

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 1149

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 12/03/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'SUMIT'

PURPOSE

SUM ELEMENTS OF REAL ARRAY

FUNCTIONAL CATEGORY: A1

LANGUAGE: FORTRAN IV

REMARKS

NONE

USAGE

ITOTAL = SUMIT (ARRAY, N)

DESCRIPTION OF PARAMETERS

SUMIT - WILL CONTAIN $ARRAY(1)+ARRAY(2)+\dots+ARRAY(N)$

ARRAY - ARRAY TO BE SUMMED

N - NUMBER OF ELEMENTS OF ARRAY TO BE SUMMED

CM REQUIRED: 16B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 11/23/76

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'TRAILBZ'

PURPOSE

CHANGE TRAILING BLANKS TO ZEROS (008)

FUNCTIONAL CATEGORY: M4

USAGE

CALL TRAILBZ (A, N)
CALL TRAILBZ (A, N, NW)
CALL TRAILBZ (A, N, NW, NC)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE PROCESSED
N - NUMBER OF WORDS OF 'A' TO BE PROCESSED
NW - NUMBER OF LAST NON-BLANK WORD OF 'A'
(0 LE NW LE N)
(NW=0 MEANS ALL OF 'A' IS BLANK)
NC - POSITION OF LAST NON-BLANK CHARACTER OF A(NW)
(0 LE NC LE 10)
(NC=0 MEANS ALL OF 'A' IS BLANK)

REMARKS

008 IS TREATED AS A BLANK.

THIS SUBROUTINE IS USEFUL WHEN GENERATING MESSAGES FOR PRINTING IN THE DAYFILE USING 'CALL REMARK'. AFTER A MESSAGE IS GENERATED WITH AN ENCODE, A CALL TO 'TRAILBZ' WILL REMOVE ANY TRAILING BLANKS. THIS WILL RESULT IN THE SHORTEST POSSIBLE MESSAGE. THIS IS PARTICULARLY DESIRABLE FOR PROGRAMS WHICH ARE RUN FROM TELETYPE, SINCE TRAILING BLANKS ARE NOT SUPPRESSED FOR DAYFILE MESSAGES.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE
LOCF
MASK
SHIFT

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 1228

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 04/08/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
TAPE LABELLED CSYSNSRDCPL; P.F. NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

08/22/77

2-150

TRAILBZ - 1 OF 1

SUBROUTINE 'UNLOAD'

PURPOSE

UNLOAD A FORTRAN FILE

FUNCTIONAL CATEGORY: Q4

USAGE

CALL UNLOAD (IUNIT)

DESCRIPTION OF PARAMETER

IUNIT - FORTRAN LOGICAL UNIT NUMBER

REMARKS

FORTRAN SEQUENTIAL FILES SHOULD HAVE THEIR BUFFERS FLUSHED
ISSUING A REWIND BEFORE CALLING THIS ROUTINE.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

CLUXXX - UNLOAD A FILE (CALLS SEVERAL OTHERS)
(WRITTEN BY C M CHERNICK)

LANGUAGE: FORTRAN IV

CM REQUIRED: 21B

AUTHOR

DAVID V SOMMER - NSRDC CODE 1892.2

DATE WRITTEN: 03/07/75

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'VALDAT'

PURPOSE

LOGICAL FUNCTION TO VALIDATE A DATE FORMAT

FUNCTIONAL CATEGORY: M4

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

'VALDAT' MUST BE DECLARED LOGICAL IN THE CALLING PROGRAM.

UPON RETURN, IF THE FORMAT WAS VALID, THE DATE IS RETURNED
AS ' MM/DD/YY '.

USAGE

VALDAT (DATE)

DESCRIPTION OF PARAMETERS

DATE - DATE TO BE ANALYZED
(IF FORMAT OK, RETURNED AS ' MM/DD/YY ')

VALDAT - WILL CONTAIN
.TRUE. - DATE FORMAT WAS OK
.FALSE. - DATE FORMAT WAS NOT OK

CM REQUIRED: 1623

METHOD

DATE FORMAT IS VALIDATED BY THE FOLLOWING CHECKS:
EXACTLY 2 SLASHES
SLASHES SEPARATED BY 1 OR 2 CHARACTERS
SLASHES NOT IN POSITIONS 1, 9 OR 10
MONTH CONTAINS 1 OR 2 DIGITS (LEADING BLANKS OK)
DAY CONTAINS 1 OR 2 DIGITS (LEADING BLANKS OK)
YEAR CONTAINS 2 DIGITS
VALDAT RETURNS IF ANY CHECK FAILS.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE
AND OR SHIFT
OTHERS
NONE

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 07/26/77

DATE(S) REVISED

LOCATION OF DECKS

SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'VALIDT'

PURPOSE

VALIDATE ARRAY 'A' TO SEE THAT EACH ELEMENT IS ONE OF THOSE
OF ARRAY 'V'

FUNCTIONAL CATEGORY: M5

LANGUAGE: FORTRAN IV EXTENDED

REMARKS

NONE

USAGE

CALL VALIDT (A, NA, V, NV, VALID)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE VALIDATED
NA - NUMBER OF ELEMENTS OF 'A' TO BE TESTED
V - ARRAY OF VALID ELEMENTS
NV - NUMBER OF ELEMENTS IN 'V'
VALID - LOGICAL OUTPUT CODE
TRUE - ALL ELEMENTS OF 'A' ARE VALID
FALSE - AT LEAST 1 ELEMENT OF 'A' IS INVALID

CM REQUIRED: 548

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

AUTHOR

DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 10/72

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'VFILL'

PURPOSE

FILL AN ARRAY WITH USER-SPECIFIED WORD

FUNCTIONAL CATEGORY: M4

USAGE

CALL VFILL (WORD, A, NA)

DESCRIPTION OF PARAMETERS

WORD - WORD TO BE PUT INTO ARRAY 'A'

A - ARRAY TO RECEIVE 'WORD'

NA - NUMBER OF WORDS IN 'A' TO BE SET TO 'WORD'

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: ?B

AUTHOR

C FLINK - KPS NWL

DATE WRITTEN: 02/10/71

DATE(S) REVISED

1974 - DAVID V SOMMER - DTNSRDC CODE 1892.2

(NAME CHANGED FROM 'MOVE' TO 'VFILL')

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'WEKDAY'

PURPOSE

DETERMINE THE DAY OF THE WEEK FOR ANY GREGORIAN DATE FROM
OCTOBER 15, 1582 THRU FEBRUARY 28, 4000

FUNCTIONAL CATEGORY: M2

USAGE

CALL WEKDAY (IERR, IDAY, IGY, IGM, IGD)

DESCRIPTION OF PARAMETERS

IERR - RETURN CODE

0 - NO ERROR

1 - AT LEAST ONE OF IGY, IGM, IGD OUT OF RANGE

IDAY - WILL CONTAIN DAY-OF-WEEK

0 (SUNDAY) THRU 6 (SATURDAY)

IGY - GREGORIAN YEAR (EG, 1975)

IGM - GREGORIAN MONTH (1-12)

IGD - GREGORIAN DAY (1-31)

REMARKS

DATES FROM JANUARY 1, 1582 THRU OCTOBER 14, 1582 AND
AFTER FEBRUARY 28, 4000 THRU DECEMBER 31, 4000 ARE NOT
VALIDATED.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

MOD

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

METHOD

SEE IBM PROGRAM DESCRIPTION 3600 03.1.004

CM REQUIRED: 1028

AUTHOR

RICHARD CONNER - IBM

DATE WRITTEN: 10/15/66

DATE(S) REVISED

04/26/73 - REWRITTEN IN FORTRAN FOR CDC 6000 - DVS

LOCATION OF DECKS

SOURCE

TAPE LABELLED CSYSNSRDCPL; P.F. NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

FUNCTION 'XOR'

PURPOSE
EXCLUSIVE OR

FUNCTIONAL CATEGORY: R1 A0

LANGUAGE: FORTRAN IV EXTENDED

REMARKS
SIMULATES I .XOR. J

USAGE
K = XOR (I, J)

DESCRIPTION OF PARAMETERS
I,J - SIMPLE VARIABLES TO BE XOR'ED TOGETHER
XOR - (INTEGER) WILL RETURN THE RESULT OF I .XOR. J

CM REQUIRED: 14B

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE
AND OR
OTHERS
NONE

METHOD
XOR = (I .AND. .NOT. J) .OR. (.NOT. I .AND. J)

AUTHOR

DATE WRITTEN: 06/23/77

DATE(S) REVISED

LOCATION OF DECKS
SOURCE
UPDATE LIBRARY: NSRDCPL,ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ZBLANK'

PURPOSE

CHANGE BLANKS TO 008 AND VICE VERSA

FUNCTIONAL CATEGORY: M4

USAGE

CALL ZBLANK (A, NA)

DESCRIPTION OF PARAMETERS

A - START OF AREA TO BE PROCESSED

NA - NUMBER OF WORDS TO BE PROCESSED

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

AND

OTHERS

NONE

ARITHMETIC STATEMENT FUNCTIONS

NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 468

AUTHOR

J. P. - KPS - NWL

DATE WRITTEN: 1973

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL, ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSROC

SUBROUTINE 'ZEROFL'

PURPOSE

ZERO FIELD LENGTH (SECURITY EOJ)

FUNCTIONAL CATEGORY: M4

USAGE

CALL ZEROFL

REMARKS

'ZEROFL' ZEROS THE JOB'S FIELD LENGTH ABOVE 778 AND ENDS
THE JOB WITHOUT DAYFILE MESSAGES.

THE INTENDED USE IS AS THE TERMINATION ROUTINE, CALLED BY
REPRIEVE, WHENEVER A UTILITY PROGRAM HAS WITHIN ITS FIELD
LENGTH DATA THAT SHOULD NOT APPEAR IN A USER'S DUMP.

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE

NONE

OTHERS

NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 21B

AUTHOR

C FLINK - KP NWL

DATE WRITTEN: 08/73

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSRDCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ZEROS'
SUBROUTINE 'ZEROES'

PURPOSE

REPLACE BLANKS WITH (DISPLAY CODE) ZEROS, MULTIPLE FIELDS

FUNCTIONAL CATEGORY: M4

USAGE

CALL ZEROS (A, S1, L1, S2, L2, ..., SN, LN)
CALL ZEROES (A, S1, L1, S2, L2, ..., SN, LN)

DESCRIPTION OF PARAMETERS

A - ARRAY TO BE PROCESSED
S - STARTING BYTE OF A FIELD
(BYTE COUNT BEGINS WITH 1 FOR THE LEFTMOST BYTE IN 'A')
L - NUMBER OF BYTES IN THIS FIELD TO PROCESS

(UP TO 31 PAIRS OF SI,LI)

REMARKS

'ZEROS' WILL REPLACE BLANKS WITH ZEROS UP TO THE 1ST
NON-BLANK CHARACTER IN A GIVEN FIELD.
IF THE 1ST NON-BLANK CHARACTER IS MINUS (-), THEN THAT
CHARACTER POSITION IS REPLACES WITH A ZERO AND THE 1ST
CHARACTER IN THE FIELD IS REPACED WITH A MINUS (-).

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE
OTHERS
NONE

LANGUAGE: CDC 6000 COMPASS

CM REQUIRED: 55B

AUTHOR

T HERRING - KPS NWL

DATE WRITTEN: 12/09/70

DATE(S) REVISED

LOCATION OF DECKS

SOURCE

UPDATE LIBRARY: NSROCPL,ID=CSYS

OBJECT

EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ZPFPUT'

PURPOSE

PUT USER-SPECIFIED PARAMETERS INTO ARRAY FOR LATER CALL TO ZPFUNC

FUNCTIONAL CATEGORY: Q0

USAGE

```
CALL ZPFPUT (IPRMS, NW)
CALL ZPFPUT (IPRMS, NW, LFN, PFN, ID, TK, RD, EX, MD, CN,
             MR, AC, CY, RP, XR, LC, RW, SN, VS, FO, ST)
```

FOR EXAMPLE:

```
CALL ZPFPUT (IPRMS, 0)
CALL ZPFPUT (IPRMS, 1, LFN)
CALL ZPFPUT (IPRMS, 5, LFN, PFN)
CALL ZPFPUT (IPRMS, 6, LFN, PFN, ID)
...
CALL ZPFPUT (IPRMS, 13, LFN, PFN, ID, TK, RD, EX, MD, CN,
             MR, AC)
...
CALL ZPFPUT (IPRMS, 22, LFN, PFN, ID, TK, RD, EX, MD, CN,
             MR, AC, CY, RP, XR, LC, RW, SN, VS, FO, ST)
```

DESCRIPTION OF PARAMETERS

IPRMS - ARRAY (MAXIMUM REQUIRED DIMENSION 22) TO BE DEFINED
NW - 0 - SET ALL 22 WORDS TO ZERO
1 THRU 22 - DEFINE NW PARAMETERS FROM THE FOLLOWING
LFN - LOCAL FILE NAME (1-7 CHARACTERS)
PFN - 4-WORD PERMANENT FILE NAME
ID - 1-9 CHARACTERS
TK - TURNKEY PASSWORD (1-9 CHARACTERS)
RD - READ PASSWORD (1-9 CHARACTERS)
EX - EXTEND PASSWORD (1-9 CHARACTERS)
MD - MODIFY PASSWORD (1-9 CHARACTERS)
CN - CONTROL PASSWORD (1-9 CHARACTERS)
MR - MULTIPLE-READ (0 OR NOT)
AC - ACCOUNT NUMBER (10 CHARACTERS, LAST IS NUMERIC)
CY - CYCLE (INTEGER -999 TO -1, 1 TO 999)
RP - RETENTION PERIOD (INTEGER 0-999)
XR - READ-ONLY PASSWORD (1-9 CHARACTERS)
LC - LOWEST CYCLE (0 OR NOT)
RW - MULTI-READ, SINGLE WRITE (0 OR NOT)
SN - SETNAME (1-7 CHARACTERS)
VS - VOLUME SERIAL NUMBER (1-7 CHARACTERS, LEFT-JUSTIFIED). RESERVED FOR FUTURE.
FO - FILE ORGANIZATION (2-CHARACTERS)
ST - STATION ID (MULTI-FRAME)
RESERVED FOR FUTURE.

NOTE: ALL VARIABLES ARE TYPE INTEGER. CHARACTER DATA IS LEFT-JUSTIFIED AND MAY BE ZERO- OR BLANK-PADDED. TO CLEAR (OR OMIT) A SPECIFIC PARAMETER, USE 0.

REMARKS
NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE
MINO MOVLEV
OTHERS
NONE

ARITHMETIC STATEMENT FUNCTIONS
NONE

LANGUAGE: FORTRAN IV

CM REQUIRED: 142B

AUTHOR
DAVID V SOMMER - DTNSRDC CODE 1892.2

DATE WRITTEN: 01/13/76

DATE(S) REVISED
01/20/76

LOCATION OF DECKS
SOURCE
UPDATE LIBRARY: NSRDCPL, ID=CSYS
OBJECT
EDITLIB USER LIBRARY: NSRDC

SUBROUTINE 'ZPFUNC'

PURPOSE

CALLABLE PERMANENT FILE FUNCTIONS

USAGE

CALL ZPFUNC (IRC, IPRMS, NW)

DESCRIPTION OF PARAMETERS

IRC - INPUT: PERMANENT FILE FUNCTION DESIRED

- 1 - ATTACH
- 2 - CATALOG
- 3 - EXTEND
- 4 - PURGE
- 5 - RENAME
- 6 - PERM

OUTPUT: ERROR RETURN CODE

(EITHER ZPFUNC- OR SCOPE-GENERATED)

ZPFUNC-GENERATED

IRC MEANING

- 1 IRC HAD ILLEGAL INPUT VALUE
- 2 LAST CHARACTER OF AC IS NOT DISPLAY CODE
NUMERIC

SCOPE-GENERATED

DEC OCT COMND MEANING

- | | | | |
|----|-----|------|------------------------------------------------|
| 0 | 000 | ALL | FUNCTION SUCCESSFUL |
| 1 | 001 | | ID ERROR |
| 2 | 002 | A,P | LFN ALREADY IN USE |
| 3 | 003 | CEPR | UNKNOWN LFN |
| 4 | 004 | C | TOO MANY CYCLES (5 MAX) |
| 5 | 005 | C,E | PF CATALOG FULL |
| 6 | 006 | | NO LFN OR PFN |
| 8 | 010 | C,E | LATEST INDEX NOT WRITTEN |
| 9 | 011 | C | FILE NOT ON A PF DEVICE |
| 10 | 012 | A | FILE NOT IN SYSTEM |
| 11 | 013 | A | ARCHIVE RETRIEVAL ABORTED |
| 12 | 014 | C,R | INVALID CYCLE NUMBER |
| 13 | 015 | C | CY LIMIT REACHED (999 MAX) |
| 14 | 016 | C | PF DIRECTORY FULL |
| 15 | 017 | CEPR | FJUNCTION ATTEMPTED ON A
NON-PERMANENT FILE |
| 16 | 020 | | FCN ATTEMPTED ON NON-LOCAL FILE |
| 18 | 022 | C | FILE NEVER ASSIGN TO A DEVICE |
| 19 | 023 | A | CYCLE INCOMPLETE OR DUMPED |
| 20 | 024 | A | FILE ALREADY ATTACHED |
| 21 | 025 | A | FILE UNAVAILABLE |
| 23 | 027 | | ILLEGAL LFN |
| 24 | 030 | A | FILE DUMPED |
| 27 | 033 | | ALTER NEEDS EXCLUSIVE ACCESS |
| 29 | 035 | C | FILE ALREADY IN SYSTEM |
| 56 | 070 | | PFM STOPPED BY SYSTEM |
| 57 | 071 | | SECURITY VIOLATION |
| 58 | 072 | | FILE DEFINITION BLOCK ADDRESS |

IPRMS - PARAMETERS FOR PF FUNCTION

IPRMS	CONIENTIS	EUNCIIONS	EQRMAT
1	LFN	ALL	1-7 CHAR, LEFT* (IF 0, 1ST 7 CHAR OF PFN ARE USED (A,C,P))
2-5	PFN	A,C,P,R	1-40 CHAR, LEFT
6	ID	A,C,P,R	1-9 CHAR, LEFT
7	TK	**,***	1-9 CHAR, LEFT
8	RD	**,***	1-9 CHAR, LEFT
9	EX	**,***	1-9 CHAR, LEFT
10	MD	**,***	1-9 CHAR, LEFT
11	CN	**,***	1-9 CHAR, LEFT
12	MR	A,C	0 OR NOT
13	AC	C,R****	10 CHAR (LAST IS NUMERIC INTEGER (1-999) NEGATIVE TO RETURN VALUE
14	CY	A,C,P,R	INTEGER (0-999)
15	RP	C,R	1-9 CHAR, LEFT
16	XR	C,R ***	0 OR NOT
17	LC	A,P	0 OR NOT
18	RW	A,C	1-7 CHAR, LEFT
19	SN	A,P	VOLUME SERIAL NUMBER (RESERVED FOR FUTURE)
20	VS		
21	FO	C	2-CHAR, LEFT (DA, IS, AK)
22	ST		STATION ID (MULTI-FRAME) (RESERVED FOR FUTURE)

A=ATTACH; C=CATALOG; P=PURGE; R=RENAME;
 * LEFT=LEFT-JUSTIFIED, BLANK OR ZERO PADDED
 ** FOR A,P, INTERPRETED AS SUBMITTED PASSWORD
 FOR C, USED AS BOTH DEFINITION AND SUBMITTED PW
 *** FOR R, WHEN SET TO 1, THE PASSWORD IS CLEARED
 **** FOR C, WHEN OMITTED, AC IS TAKEN FROM CHARGE CARD
 OR LOGIN

NW - NUMBER OF LAST FILLED ELEMENT IN IPRMS (OPTIONAL)

REMARKS
 NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE

AND SHIFT
OTHERS

IZPFBTZ
IZRT9ZR
NUMVAR
ZPFMAC
ZPFPSW

CM REQUIRED: 445B

AUTHOR

C M CHERNICK - NSRDC CODE 1832

DATE WRITTEN: 01/75

DATE(S) REVISED

05/75 01/02/76

LANGUAGE: FORTRAN IV EXTENDED

FUNCTIONAL CATEGORY: Q3

LOCATION OF DECKS

SOURCE

CODE 1832

OBJECT

EDITLIB USER LIBRARY: NSRDC

EXAMPLE

```
PROGRAM TEST (INPUT, OUTPUT, TAPE5=INPUT, TAPE6=OUTPUT
DIMENSION IPRMS(22)
DATA LFN / 6LMYFILE/
DATA ID / 4LCXXX/
DATA IPFN1, IPFN2/ 10HPERMANENTF, 3LILE/
DATA IAC / 1049876543210/ (SEE NOTE BELOW)
DATA IPW / 8LPASSWORD/
```

...

```
DO 10 I=1,22
10 IPRMS(I) = 0
   IPRMS( 1) = LFN
   IPRMS( 2) = IPFN1
   IPRMS( 3) = IPFN2
   IPRMS( 6) = ID
   IPRMS( 7) = IPW
   IPRMS(13) = IAC (SEE NOTE BELOW)
   IRC = 2
   NW = 13
   CALL ZPFUNC (IRC, IPRMS, NW)
   IF (IRC .NE. 0) WRITE (6, 20) IRC, IRC
20 FORMAT (*0ERROR - IRC=* I7, * OR * 03, *8*)
```

...

```
STOP
END
```

THIS PROGRAM IS EQUIVALENT IN EFFECT TO THE FOLLOWING
CONTROL CARDS:

```
CATALOG(MYFILE,PERMANENTFILE,ID=CXXX,AC=9876543210,
        PW=PASSWORD)
```

FOR A NEW CYCLE OF AN EXISTING FILE:

```
CATALOG(MYFILE,PERMANENTFILE,ID=CXXX,AC=9876543210,
        TK=PASSWORD)
```

FOR THE CREATION OF A NEW FILE.

NOTE: IF THESE TWO LINES ARE OMITTED (THAT IS, AC IS
ZERO), AC WILL BE TAKEN FROM THE BATCH CHARGE CARD
OR THE INTERCOM LOGIN.

SUBROUTINE 'ZRTPUT'

PURPOSE

PUT USER-SPECIFIED PARAMETERS INTO ARRAY FOR LATER CALL TO
ROUTE

FUNCTIONAL CATEGORY: Q0

USAGE

CALL ZRTPUT (IPRMS, NW)
CALL ZRTPUT (IPRMS, NW, LFN, DC, TID, FID, DEF, RETJOB, FC,
EC, IC, STID, PRI, REP)

FOR EXAMPLE:

CALL ZRTPUT (IPRMS, 0)
CALL ZRTPUT (IPRMS, 1, LFN)
CALL ZRTPUT (IPRMS, 2, LFN, DC)

CALL ZRTPUT (IPRMS, 12, LFN, DC, TID, FID, DEF, RETJOB, FC,
EC, IC, STID, PRI, REP)

DESCRIPTION OF PARAMETERS

IPRMS - ARRAY (MAXIMUM REQUIRED DIMENSION 12) TO BE DEFINED
NW - 0 - SET ALL 12 WORDS TO ZERO
1 THRU 12 - DEFINE NW PARAMETERS FROM THE FOLLOWING
LFN - LOCAL FILE NAME (1-7 CHARACTERS)
DC - DISPOSITION CODE (2 CHARACTERS)
TID - TERMINAL IDENTIFICATION
1LC - CENTRAL SITE
2-CHARACTER TERMINAL ID
4LHERE - ROUTE TO THIS TERMINAL
FID - FILE IDENTIFICATION
1L* -OR-
1-5 CHARACTER FILE ID, PRECEDED BY *
DEF - 3LDEF - DEFER ROUTE UNTIL END OF JOB
RETJOB - NON-ZERO TO RETURN JOB NAME IN THIS WORD
FC - FORMS CODE (2 CHARACTERS)
EC - EXTERNAL CHARACTERISTICS
FOR PRINT:
2LB4, 2LB6, 2LA6, 2LA9
FOR PUNCH:
2LSB, 5L80COL, 3L026, 3L029, 5LASCII
IC - INTERNAL CHARACTERISTICS
0 OR 3LDIS - DISPLAY CODE
5LASCII - ASCII
3LBIN - BINARY
STID - 3-CHARACTER STATION ID (RESERVED FOR FUTURE)
PRI - PRIORITY (TO ROUTING TERMINAL ONLY)
(0000B-7777B)
ALL OTHERS USE 0
REP - REPEAT COUNT (0-31 (37B))

NOTE: ALL VARIABLES ARE TYPE INTEGER. CHARACTER DATA IS
LEFT-JUSTIFIED AND ZERO-PADDED.
TO CLEAR (OR OMIT) A SPECIFIC PARAMETER, USE 0.

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED
PART OF LANGUAGE
MINO MOVLEV
OTHERS
NONE

ARITHMETIC STATEMENT FUNCTIONS
NONE

LANGUAGE: FORTRAN IV EXTENDED

CM REQUIRED: 768

AUTHOR
DAVID V SOMMER - DTNSRDC CODE 1892.2

DATA WRITTEN: 01/19/76

DATE(S) REVISED
01/24/77 - ADD REP PARAMETER

LOCATION OF DECKS
SOURCE
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SUBROUTINE 'ZSYSEQ'

PURPOSE

FORTRAN CALLABLE SYSTEM CALL

FUNCTIONAL CATEGORY: Q3

USAGE

CALL ZSYSEQ (I)

DESCRIPTION OF PARAMETER

I - THE CONTENTS OF I ARE PUT INTO X6 BEFORE THE SYSTEM
IS CALLED

EXAMPLE

CALL SYSTEM ROUTINE DSP WITH PARAMETERS CONTAINED IN 'A':

CALL ZSYSEQ (4LDSP+LOC(A))

NOTE: THE P AFTER DSP IS THE RECALL BIT. IF NO RECALL
REQUIRED, THEN:

CALL ZSYSEQ (3LDSP+LOC(1))

REMARKS

NONE

SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED

PART OF LANGUAGE

NONE

OTHERS

SYS=

LANGUAGE: CDC 6000 COMPASS

GM REQUIRED: 48

AUTHOR

C M CHERNICK - DTNSRDC CODE 1832

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DATE(S) REVISED

LOCATION OF DECKS

SOURCE

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